The Goodyear Tire & Rubber Company

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August 5, 2015

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Rasha Allen
Kansas Department of Health and Environment
Bureau of Air
1000 SW Jackson, Suite 310
Topeka, Kansas 66612-1366

***RE: The Goodyear Tire & Rubber Company; Topeka Plant (Source ID #: 1770007)
Mixer #1 Prevention of Significant Deterioration Permit Application***

Dear Ms. Allen:

The Goodyear Tire & Rubber Company (Goodyear) in Topeka, KS submitted a Prevention of Significant Deterioration permit application for the installation of a new Mixer #5B, a new 15 MMBtu/hr regenerative thermal oxidizer (RTO), and use of coupling agent in Mixer #1 at temperatures exceeding 285 degrees Fahrenheit to the Kansas Department of Health and Environment (KDHE) in December of 2014. Recently, Goodyear has elected not to pursue installation of a new Mixer #5B, instead focusing on repermitting Mixer #1 to allow for the use of high temperature coupling agents, and would like to permit the installation of a 5 MMBtu/hr RTO as opposed to the initial plan of an RTO with a capacity of 15 MMBtu/hr.

All necessary updates to the application have been made. Please find enclosed six (6) signed copies (3 confidential copies and 3 public copies) of the Mixer #1 Prevention of Significant Deterioration (PSD) Permit Application for the Goodyear plant.

Goodyear is submitting separate confidential and public versions of the application in order to address information contained in Appendix D of the enclosed application which Goodyear would like to request remain confidential. Specifically, Appendix D contains data from the Goodyear Lawton, Oklahoma plant, which is referenced in this application, and includes capture efficiency data for the regenerative thermal oxidizer (RTO). Tables 4.1-A, 4.1-B, and 4.2 and the subsequent 4 pages of Appendix D, which include a discussion of test results, contain detailed process information such as batch size, mix times, mix temperatures, and equipment design, as well as enough material usage information that could be used to back-calculate specific rubber compound recipe information (e.g. coupler dosage rates related to rubber compound recipe code numbers). For this reason Goodyear is requesting these pages of the application remain confidential. The confidential information is masked in the three (3) enclosed public versions of the application. Goodyear has also enclosed three (3) uncensored copies of the application.

Sincerely,

Curt Deitz
Environmental Manager

Enclosures

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PUBLIC VERSION

PSD PERMIT APPLICATION

The Goodyear Tire & Rubber Company > Topeka Facility

GOODYEAR

Mixer #1 Application

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August 2015

Project 141701.0028

Trinity Consultants

Environmental solutions delivered uncommonly well

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1. INTRODUCTION

1.1. EXECUTIVE SUMMARY

The Goodyear Tire & Rubber Company (Goodyear) owns and operates a rubber tire manufacturing plant in Topeka, Kansas (Goodyear Topeka). The plant produces a variety of off-the-road (OTR) and truck tires. The plant's Standard Industrial Classification (SIC) code is 3011 – Manufacture of Tires and Tubes, and the plant's North American Industry Classification System (NAICS) code is 326211 – Tire Manufacturing.

Goodyear Topeka is classified as a major source under Title V of the Clean Air Act (CAA) and the Kansas Regulations for Operating Permits, K.A.R. 28-19-500. The Topeka facility is also an existing major source under the Prevention of Significant Deterioration (PSD) program. The Topeka facility is currently operating in accordance with Kansas Department of Environmental Health and Safety (KDHE) Title V Operating Permit Source ID No. 1770007[1].

With this application, Goodyear would like to permit the use of coupling agent in the existing Mixer #1 (EU-MX01) at drop temperatures exceeding 285 degrees Fahrenheit (°F), which is the maximum temperature the Topeka facility is currently permitted to mix coupling agent at on Mixer #1 (as drop temperatures above 285 °F would result in a release of ethanol emissions) in accordance with the construction approval modification issued by the KDHE on June 16, 2014. The proposed project will remove this cap on drop temperature. The permitted rubber throughput in the June 16, 2014 construction approval modification will remain the same, however. Upon completion of the proposed project, Mixer #1 will have the capability to process silica and coupling agent rubber formulations.

Goodyear is also proposing to install a new 5 MMBtu/hr regenerative thermal oxidizer (RTO) to reduce VOC emissions generated from coupling agent use on Mixer #1. The RTO will only run when Mixer #1 is mixing ethanol containing compounds. The RTO is expected to have a control efficiency of 98 percent (%) and a theoretical capture efficiency of 84%.

The VOC emission increase from the proposed coupling agent throughput increase exceeds the PSD significant emission rate (SER). Therefore, the project will be subject to PSD review. As demonstrated in this application, the project is subject to PSD permitting for VOC only, as the net emissions increases for all other pollutants are below the corresponding PSD SERs.

As part of the PSD application, Goodyear has performed a Best Available Control Technology (BACT) analysis. The BACT analysis demonstrates that the RTO is the top tier control device for VOC. An ambient air impacts analysis will not be performed for the project since VOCs are not modeled for National Ambient Air Quality Standards (NAAQS) or PSD Increment compliance purposes. The proposed project will require a significant modification to Goodyear Topeka's Title V operating permit as defined in K.A.R. 28-19-513(d).

1.2. SITE DESCRIPTION

Goodyear Topeka is located in the City of Topeka, Kansas, which is bounded by Shawnee County. Shawnee County has been designated by the US EPA as "attainment" or "unclassifiable" for all criteria pollutants. The area map presented in Appendix A shows the location of Goodyear Topeka with respect to the surrounding area. U.S.

[1] Goodyear submitted a Title V renewal application in February 2014 for the Topeka facility. The application is currently undergoing KDHE review.

Highway 24 runs along the south boundary of Goodyear Topeka. A plot plan is also included in Appendix A to provide a more detailed illustration of the Goodyear Topeka building layout.

1.3. APPLICATION CONTENTS

This application for the PSD permit contains the following elements:

- Section 2 contains a project description;
- Section 3 lists sample emissions calculations;
- Section 4 includes a regulatory applicability analysis;
- Section 5 includes a BACT analysis;
- Section 6 details ambient monitoring criteria;
- Section 7 includes a Class I area analysis;
- Section 8 includes the additional impacts analysis;
- Section 9 includes the appropriate KDHE permit application forms;
- Appendix A contains an area map;
- Appendix B contains detailed emission calculations;
- Appendix C contains the RACT/BACT/LAER Clearinghouse report; and
- Appendix D contains data from the Goodyear Lawton plant, which is referenced in this application, and includes capture efficiency data for the RTO.

2. PROJECT DESCRIPTION

2.1. MIXER OVERVIEW

Rubber mixing is currently conducted in eleven mixers at Goodyear Topeka. The mixing materials include carbon black, process oils, pigments, natural rubber, synthetic rubber, and specially-formulated coupling agents. The mixers are fed manually with raw materials, oil is injected at a certain interval within the mixing cycle, and the entire mixture is blended in batch mode. The mixed batch then falls from the mixer onto a mill, a roller die extruder, or other device where it is further blended. The batch is then processed into either continuous slab rubber or into small "pellets" of rubber for temporary storage. Particulate matter (PM) emissions from the mixers are controlled with fabric filters.

A portion of the tires manufactured at Goodyear Topeka are produced using coupling agents. Usage of the coupling agent allows Goodyear to meet the increasing demands of auto manufacturers and to meet the United States Environmental Protection Agency's (U.S. EPA) Corporate Average Fuel Economy (CAFE) standards. The processing of rubber containing the coupling agent results in levels of ethanol (i.e. VOC) emissions that do not occur from the mixing of other rubber formulations.

2.2. PROJECT OVERVIEW

With this project, Goodyear is proposing a series of upgrades. The facility upgrades associated with the project are detailed below:

- Installation of a new 5 MMBtu/hr RTO to control VOC emissions from the existing Mixer #1
- Addition of coupling agent to existing Mixer #1 (EU-MX01) at drop temperatures exceeding 285°F.

Upon completion of the project, Mixer #1 will have the ability to process coupling agent at high (i.e. > 300°F) and low (i.e. 250°F - 300°F) temperatures. Given the large quantity of coupling agent the facility anticipates using per pound of rubber mixed, Goodyear is conservatively assuming ethanol (i.e. VOC) emissions resulting from the use of coupling agent in Mixer #1 form at a drop temperature of 250°F or higher. VOC emissions from Mixer #1 will be controlled by RTO-1 whenever rubber formulations including coupling agent are mixed. RTO-1 will not operate if Mixer #1 is not mixing coupling agent at temperatures exceeding 250°F.

3. PROJECTED EMISSIONS

This section details the methodology used to calculate emissions of PSD regulated air pollutants from the proposed project. Mixer #1 produces slab rubber. Therefore, there will be no associated emissions increase from Pellet Processing. Furthermore, emissions from Milling, Calendering, Extruding, Tire Building, and Boiler Operations will not be impacted by the proposed project, as the Topeka facility will continue to be bottlenecked by the curing process post-project. This project is not intended to increase tire production at the facility, rather completion of this project will allow the Topeka facility to mix on-site a portion of the rubber that the facility currently imports, thus offsetting the total amount of rubber that is imported on an annual basis.

All processes affected by the proposed project (i.e. mixing, and curing) also emit hazardous air pollutants (HAPs). HAPs are not a PSD regulated air pollutant and, therefore, have not been detailed in Section 3.1 below. The same general calculation methodologies used to obtain PM and VOC emissions were used to calculate HAP emissions, however.

Detailed emission calculations for all pollutants are provided in Appendix B.

3.1. EMISSION CALCULATION METHODOLOGY

Mixer PM Emissions:

PM emissions from the mixing process were calculated using the mixed ethanol emitting rubber throughputs for the respective mixer and the Rubber Manufacturer Association (RMA) PM emission factors for ethanol emitting rubber. RMA only provides mixing emission factors for PM. Therefore, it is conservatively assumed PM_{10} and $PM_{2.5}$ are equivalent to PM. The emission factors presented in RMA are a combination of emissions from productive and non-productive passes. Non-productive mixing is approximately 90 percent (%) of the total[2]. Upon completion of the proposed project Mixer #1 is assumed to mix both productive and non-productive rubber. Therefore, the entire emission factor was used to calculate future potential emissions. Currently, however, Mixer #1 is permitted to only mix non-productive rubber. Consequently, baseline emissions for Mixer #1 were derived by multiplying the RMA emission factors by 90%.

An example calculation showing uncontrolled PM emissions from Mixer #1 is detailed below:

$$\text{Mixer \#1 Potential Uncontrolled PM Emissions from Ethanol Emitting Rubber (tpy)} = \text{Mixer \#1 Potential Ethanol Emitting Rubber Throughput} \left(\frac{\text{lb}}{\text{yr}}\right) \times \text{Emission Factor} \left(\frac{\text{lb PM}}{\text{lb mixed rubber}}\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right)$$

$$\text{Mixer \#1 Potential Uncontrolled PM Emissions from Ethanol Emitting Rubber} = 181{,}040{,}000 \left(\frac{\text{lb}}{\text{yr}}\right) \times 4.0E-04 \left(\frac{\text{lb PM}}{\text{lb mixed rubber}}\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right) = 36.21 \text{ tpy}$$

Mixer #1 is equipped with a fabric filter to control PM emissions. The control efficiency of the fabric filter is 99%. An example calculation showing the controlled PM emissions is as follows:

$$\text{Mixer \#1 Potential Controlled PM Emissions from Ethanol Emitting Rubber} = \text{Mixer \#1 Potential Uncontrolled PM Emissions from E Rubber (tpy)} \times (1 - \text{Control Efficiency \%})$$

$$\text{Mixer \#1 Potential Controlled PM Emissions from Ethanol Emitting Rubber} = 36.21 \text{ (tpy)} \times (1 - 99\%) = 0.36 \text{ tpy}$$

---

[2] AP-42, Compilation of Air Pollutant Emission Factors, Section 4.12 – Manufacture of Rubber Products, Table 4.12-4, DRAFT (6/99).

Mixer VOC Emissions:

Mixing Emissions

VOC emissions occur from both the mixing and curing processes associated with the mixer. Similar to PM emissions, VOC emissions from the mixing process were calculated using the mixed ethanol emitting rubber throughputs for the respective mixer and the Rubber Manufacturer Association (RMA) VOC emission factor for the ethanol emitting rubber. The emission factors presented in RMA are a combination of emissions from productive and non-productive passes. Non-productive mixing is approximately 90 percent (%) of the total. Upon completion of the proposed project Mixer #1 is assumed to mix both productive and non-productive rubber. Therefore, the entire emission factor was used to calculate future potential emissions. Currently, however, Mixer #1 is permitted to only mix non-productive rubber. Consequently, baseline emissions for Mixer #1 were derived by multiplying the RMA emission factors by 90%.

An example calculation showing uncontrolled VOC emissions from Mixer #1 from the mixing process is detailed below:

$$\text{Mixer \#1 Potential Uncontrolled VOC Emissions from Ethanol Emitting Rubber from Mixing (tpy)} = \text{Mixer \#1 Potential Ethanol Emitting Rubber Throughput} \left(\frac{\text{lb}}{\text{yr}}\right) \times \text{Emission Factor} \left(\frac{\text{lb VOC}}{\text{lb mixed rubber}}\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right)$$

$$\text{Mixer \#1 Potential Uncontrolled VOC Emissions from Ethanol Emitting Rubber from Mixing} = 181{,}040{,}000 \left(\frac{\text{lb}}{\text{yr}}\right) \times 3.86E-05 \left(\frac{\text{lb VOC}}{\text{lb mixed rubber}}\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right) = 3.50 \text{ tpy}$$

A RTO will be installed to control VOC emissions generated from coupling agent used in the mixing process associated with Mixer #1. The theoretical capture efficiency of the RTO will be 84% and the control efficiency will be 98%. An example calculation showing the RTO controlled VOC emissions from Mixer #1 from the mixing process is as follows:

$$\text{Mixer \#1 Potential Controlled VOC Emissions from Ethanol Emitting Rubber from Mixing} = \text{Mixer \#1 Potential Uncontrolled VOC Emissions from Ethanol Emitting Rubber from Mixing (tpy)} \times \Big((1 - \text{Capture Efficiency \%}) + \big(\text{Capture Efficiency \%} \times (1 - \text{Control Efficiency \%})\big)\Big)$$

$$\text{Mixer \#1 Potential Controlled VOC Emissions from Ethanol Emitting Rubber from Mixing} = 3.50 \text{ (tpy)} \times \Big((1 - 84\%) + \big(84\% \times (1 - 98\%)\big)\Big) = 0.62 \text{ tpy}$$

Curing Emissions

VOC emissions from the curing process were calculated in a similar manner to that used to calculate VOC emissions from the mixing process by multiplying the cured rubber throughput for the respective mixer by the RMA VOC emission factor. No control efficiency was applied to the resulting emissions, however, as emissions from the curing process are fugitive and the RTO will only control VOC emissions from the mixing process. There are also fugitive VOC emissions from the curing mold releases that will be used. Similarly, the cured rubber throughput for the mixer was multiplied by the fugitive VOC emission factor to obtain the fugitive VOC emissions from the curing process. The fugitive VOC emission factor used in the calculations was based on the amounts of curing mold release agents used and their respective VOC contents as reported in the R.Y. 2013 Air Emissions Inventory (AEI).

An example calculation showing fugitive VOC emissions from the curing process resulting from curing the ethanol emitting rubber that has been mixed on Mixer #1 is detailed below:

$$\text{Potential Fugitive VOC Emissions from Curing Mixer \#1 Rubber (tpy)} = \text{Mixer \#1 Potential Cured Throughput} \left(\frac{\text{lb}}{\text{yr}}\right) \times \left(\text{RMA Emission Factor} \left(\frac{\text{lb VOC}}{\text{lb cured rubber}}\right) + \text{Fugitive Emission Factor} \left(\frac{\text{lb VOC}}{\text{lb cured rubber}}\right)\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right)$$

$$\text{Potential Fugitive VOC Emissions from Curing Mixer \#1 Rubber} = 181{,}040{,}000 \left(\frac{\text{lb}}{\text{yr}}\right) \times \left(3.37E-04 \left(\frac{\text{lb VOC}}{\text{lb cured rubber}}\right) + 1.53\text{E}-06 \left(\frac{\text{lb VOC}}{\text{lb cured rubber}}\right)\right) \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right) = 30.68 \text{ tpy}$$

<u>Coupling Agent Emissions</u>

Additionally, the coupling agent used will produce ethanol, a VOC, through a series of chemical reactions. The evolution of ethanol is dependent on the processing temperature and rubber formulation. VOC emissions are split between mixing (25-75%) and curing (75-25%), dependent on the type of coupling agent processed. Therefore, to ensure permitting of the worst-case emissions, Goodyear has calculated potential emissions based on processing of high temperature coupling agent (75% of VOC released during mixing), and low temperature coupling agent (25% of VOC released during mixing). The balance of the ethanol emissions not emitted during mixing are emitted during the curing process, and are accounted for in the curing operation.

Goodyear is proposing to permit the use of two types of high and low temperature coupling agent: liquid coupling agent and solid coupling agent. The liquid coupling agent Goodyear is proposing to use produces 0.388 pounds of ethanol per pound of coupling agent in the high temperature scenario and 0.342 pounds of ethanol per pound of coupling agent in the low temperature scenario. The solid coupling agent Goodyear is proposing to use produces 0.194 pounds of ethanol per pound of coupling agent in the high temperature scenario, and 0.171 pounds of ethanol per pound of coupling agent in the low temperature scenario. Note that the solid coupling agent is half the strength of the liquid coupling agent, thus double the amount of the solid coupling agent will be used such that ethanol emissions from liquid and solid coupling agents will be identical.

An example calculation showing uncontrolled VOC emissions from high temperature solid coupling agent usage in Mixer #1 from the mixing process is detailed below:

$$\text{Mixer \#1 Potential Uncontrolled High Temperature Coupling Agent VOC Emissions (tpy)} = \text{Mixer \#1 Potential Throughput} \left(\frac{\text{lb}}{\text{yr}}\right) \times \text{Max Solid CA Usage} \left(\frac{\text{lb CA}}{\text{lb mixed rubber}}\right) \times \text{Solid CA VOC EF} \left(\frac{\text{lb VOC}}{\text{lb CA}}\right) \times \text{Percent VOC Emissions from Mixing} \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right)$$

$$\text{Mixer \#1 Potential Uncontrolled High Temperature Coupling Agent VOC Emissions} = 181{,}040{,}000 \left(\frac{\text{lb}}{\text{yr}}\right) \times 0.048 \left(\frac{\text{lb CA}}{\text{lb mixed rubber}}\right) \times 0.194 \left(\frac{\text{lb VOC}}{\text{lb CA}}\right) \times 75\% \div 2{,}000 \left(\frac{\text{lb}}{\text{ton}}\right) = 632.19 \text{ tpy}$$

The RTO will control both high (i.e. > 300°F) and low (i.e. 250°F - 300°F) temperature coupling agent VOC emissions from Mixer #1. An example calculation showing the RTO controlled VOC emissions from high temperature solid coupling agent usage in Mixer #1 from the mixing process is as follows:

$$\text{Mixer \#1 Potential Controlled High Temperature Coupling Agent VOC Emissions (tpy)} = \text{Mixer \#1 Potential Uncontrolled High Temperature Coupling Agent VOC Emissions (tpy)} \times \Big((1 - \text{Capture Efficiency \%}) + \big(\text{Capture Efficiency \%} \times (1 - \text{Control Efficiency \%})\big)\Big)$$

$$\text{Mixer \#1 Potential Controlled High Temperature Coupling Agent VOC Emissions} = 632.19\ (\text{tpy}) \times \left((1-84\%) + \left(84\% \times (1-98\%)\right)\right) = 111.77\ \text{tpy}$$

VOC emissions from coupling agent usage from the curing process were calculated in a similar manner to that used to calculate VOC emissions from coupling agent usage from the mixing process. No control efficiency was applied to the resulting emissions, however, as the RTO will only control VOC emissions from the mixing process.

RTO VOC Emissions:

The RTO will have a heat input capacity of 5 MMBtu/hr and will combust natural gas. Potential emissions from the RTO were calculated assuming continuous operation (i.e. 8,760 hours per year) and using natural gas emission factors from AP-42, Chapter 1.4.

An example calculation showing VOC emissions from the RTO is detailed below:

$$\text{RTO Potential VOC Emissions (tpy)} = \text{Max Heat Input Capacity}\left(\frac{\text{MMBtu}}{\text{hr}}\right) \times \text{Hours of Operation}\left(\frac{\text{hrs}}{\text{yr}}\right) \div \text{Higher Heating Value}\left(\frac{\text{Btu}}{\text{SCF}}\right) \times \text{AP-42 Emission Factor}\left(\frac{\text{lb}}{\text{MMCF}}\right) \div 2{,}000\left(\frac{\text{lb}}{\text{ton}}\right)$$

$$\text{RTO Potential VOC Emissions (tpy)} = 5\left(\frac{\text{MMBtu}}{\text{hr}}\right) \times 8{,}760\left(\frac{\text{hrs}}{\text{yr}}\right) \div 1{,}020\left(\frac{\text{Btu}}{\text{SCF}}\right) \times 5.5\left(\frac{\text{lb}}{\text{MMCF}}\right) \div 2{,}000\left(\frac{\text{lb}}{\text{ton}}\right) = 0.12\ \text{tpy}$$

3.2. BASELINE ACTUAL EMISSIONS

Baseline actual PM and VOC emissions from mixing and curing were calculated for Mixer #1. Emissions were calculated for the mixer for the last nine years (i.e. 2013-2005) using actual throughput data and the methodologies described in Section 3.1 above. The annual average emission rates for 2012 and 2013 were chosen to represent the baseline actual emissions.

An example calculation of VOC baseline actual emissions for Mixer #1 is as follows:

$$\text{Mixer \#1 Baseline Actual VOC Emissions} = \frac{\sum \text{2012 VOC Emissions}\left(\frac{\text{ton}}{\text{yr}}\right) + \sum \text{2013 VOC Emissions}\left(\frac{\text{ton}}{\text{yr}}\right)}{2}$$

$$\text{Mixer \#1 Baseline Actual VOC Emissions} = \frac{4.07\text{E}-04\left(\frac{\text{ton}}{\text{yr}}\right) + 4.38\text{E}-02\left(\frac{\text{ton}}{\text{yr}}\right)}{2} = 2.21\text{E}-02\ (\text{tpy})$$

3.3. FUTURE POTENTIAL AND PROJECTED ACTUAL EMISSION CALCULATIONS

Potential emissions from Mixer #1 for the mixing and curing processes was calculated based on a potential throughput of 181,040,000 pounds of rubber per year[3]. The calculation methodologies described in Section 3.1 above were used to calculate future potential emissions from Mixer #1.

[3] 181,040,000 pounds of rubber per year is consistent with the June 16, 2014 construction approval modification (originally issued on October 17, 2011).

3.4. NET EMISSIONS INCREASE CALCULATIONS

Table 3-1 shows the calculated emissions increase from the proposed project compared to the PSD SERs. Emissions of VOC are above the associated SER due to the projected increase in coupling agent throughput. Note, there have been no projects at the facility which are associated with the proposed mixer modifications. Therefore, there are no associated projects included in the PSD significant emissions increase (SER) calculations.

Table 3-1. Project Emission Summary

Project Emissions Increase Summary									
Source	Total PM (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	NO_X (tpy)	Lead (tpy)	CO_2e (tpy)
Potential Emissions from New/Modified Units									
Scenario 1 - High Temperature Coupling Agent:									
Mixer 1[1,2]	0.36	0.36	0.36	--	353.72	--	--	-1.63E-08	--
RTO - Natural Gas Usage	0.16	0.16	0.16	1.80	0.12	0.01	2.15	1.07E-05	2,591.78
Scenario 1 - Total	*0.52*	*0.52*	*0.52*	*1.80*	*353.84*	*0.01*	*2.15*	*1.07E-05*	*2,591.78*
Scenario 2 - Low Temperature Coupling Agent:									
Mixer 1[1,2]	0.36	0.36	0.36	--	510.66	--	--	-1.63E-08	--
RTO - Natural Gas Usage	0.16	0.16	0.16	1.80	0.12	0.01	2.15	1.07E-05	2,591.78
Scenario 2 - Total	*0.52*	*0.52*	*0.52*	*1.80*	*510.78*	*0.01*	*2.15*	*1.07E-05*	*2,591.78*
Total[3]	0.52	0.52	0.52	1.80	510.78	0.01	2.15	0.00	2591.78
Net Emission Increase	0.52	0.52	0.52	1.80	510.78	0.01	2.15	1.07E-05	2,591.78
SER	25	15	10	100	40	40	40	0.6	75,000
Exceeds	No	No	No	No	Yes	No	No	No	No

[1] Includes controlled emissions from the mixing operations and fugitive emissions from the curing operations.

[2] The emission increase associated with Mixer 1 is calculated by subtracting baseline emissions from future potential emissions. Baseline emissions from Mixer 1 included the mixing of all rubber components. Future potential emissions allocate 100% of the annual throughput estimated for Mixer 1 to mixing the ethanol emitting rubber. There is no RMA emission factor for lead from the ethanol emitting rubber, however, so the calculated emission increase for lead is negative.

[3] VOC emissions from Mixer 1 are based on Scenario 2, which yields the overall worst-case emissions for the mixing and curing processes combined.

4. REGULATORY APPLICABILITY ANALYSIS

4.1. PREVENTION OF SIGNIFICANT DETERIORATION

Goodyear Topeka is classified as an existing major source under the PSD regulations. Therefore, the emission increases from all modifications to the facility must be compared against the PSD SERs in order to determine if PSD permitting is required. As summarized in Table 3-1, projected VOC emission increases are above the PSD SER for VOC. Therefore, the proposed project is a major modification as defined in 40 CFR 52.21(b)(2)(i), and subject to New Source Review permitting requirements under 40 CFR 52.21(r)(4). There have been no projects at the facility which are associated with the proposed mixer modifications. Therefore, there are no associated projects included in the PSD SER comparisons.

K.A.R. 28-19-350 incorporates by reference the preconstruction air quality analysis requirement for modifications for each pollutant, which results in a significant net emissions increase. As part of the preconstruction air quality analysis, if existing representative air quality monitoring data is not available, the facility may be required to establish a site-specific air quality network. VOC is the only pollutant that is increasing in a significant quantity as a result of this project. VOC is a precursor to ozone, which is a regional pollutant. There is an air quality monitor located at 2501 Randolph Avenue in Topeka, KS, which is less than 10 miles from the Topeka site. The air quality monitor is considered representative of the air quality at the site. Since a representative air quality monitor is available for the Topeka site, Goodyear does not intend to install air quality monitors as part of this project. Please see Section 6 of this report for further discussion on this determination.

4.2. STATE MINOR NSR APPLICABILITY

The minor (or Kansas state) NSR program is in K.A.R. 28-19-300. The proposed project is required to obtain a construction permit or construction approval if the increase in the PTE resulting from the modification equals or exceeds the emission thresholds specified in K.A.R. 28-19-300(a) or K.A.R. 28-19-300(b), respectively. As shown in Table 3-1 above, VOC emissions from the proposed project exceed the VOC construction permitting emissions threshold in K.A.R. 28-19-300(b). The proposed project is already triggering PSD permitting for VOC, however. Consequently, minor NSR permitting is not required for VOC. Goodyear has conducted a BACT analysis on a pollutant-by-pollutant basis for VOC in Section 5 of this application. By complying with major NSR BACT requirements, the facility will be in compliance with minor NSR requirements.

4.3. TITLE V AND STATE PERMITTING REQUIREMENTS

The major source thresholds with respect to Kansas's Title V operating permit program regulations are 10 tons per year (tpy) of a single hazardous air pollutant (HAP), 25 tpy of any combination of HAP, 100 tpy of other regulated pollutants. Potential emissions from the Topeka site exceed the major source thresholds for several pollutants. Therefore, the plant is subject to Title V and is operating under the state issued Federal Operating Permit Source ID No. 1770007.

The Topeka facility currently has a condition in their Title V operating permit that limits VOCs emitted from the mixing and curing operations generated from the use of coupling agent to less than 440 tons per year. While the Title V operating permit lists the specific emission units this condition applies to and the existing Mixer #1 is not included as an affected source, it is assumed the KDHE will require a significant modification to the facility's operating permit in accordance with K.A.R. 28-19-513(d).

4.4. NSPS SUBPART BBB - RUBBER TIRE MANUFACTURING

New Source Performance Standard (NSPS) Subpart BBB applies to undertread cementers, sidewall cementers, tread end cementers, bead cementers, and green tire spraying machines that have been installed or modified after January 20, 1983 and process tires having a bead diameter less than or equal to 19.7 inches. The proposed project addressed in this application does not involve any equipment subject to Subpart BBB. Therefore, this standard does not apply to this application.

4.5. NESHAP SUBPART XXXX - RUBBER TIRE MANUFACTURING

The Rubber Tire Manufacturing MACT applies to any source that uses or processes cements and solvents that is located at a major source of HAP. The Topeka facility is classified as a major source of HAP. Therefore, any source that uses or processes cements and solvents is subject to Subpart XXXX. Mixer #1 is currently subject to Subpart XXXX. Consequently, Subpart XXXX will apply to the proposed project. Goodyear Topeka will continue to comply with the emission limits of Subpart XXXX using the purchase alternative option detailed in 40 CFR 63.5985(a). The applicable recordkeeping and reporting requirements of Subpart XXXX will also be followed.

4.6. KANSAS REGULATIONS

The regulations contained in the Kansas Administrative Regulations that are applicable to the proposed project are detailed below.

4.6.1. K.A.R. 28-19-650(a)(3) Emissions Opacity Limits

K.A.R. 28-19-650(a)(3) limits opacity from emission units installed after January 1, 1971 to 20%. The new RTO will be installed after January 1, 1971 and will therefore be subject to K.A.R. 28-19-650 (a)(3). As such, Goodyear Topeka will limit opacity from this emission unit to 20% opacity.

5. BACT ANALYSIS

The requirement to conduct a BACT analysis is found in the Clean Air Act (CAA), in the federal regulations implementing the PSD program, the regulations governing federal approval of state PSD programs, and Kansas regulations. The definition of BACT given by the Code of Federal Regulations 40 CFR 52.21 (b)(12) is as follows:

> *"...an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs..."*

The BACT determination performed for the proposed project is limited to VOC, the only pollutant above the PSD SERs in this PSD application. The proposed project will not result in a significant increase in any other criteria pollutants.

5.1. PSD REVIEW FOR VOC

The proposed project results in an emission increase of VOC from the entire project above the PSD SER (40 tpy). Therefore, PSD review is required for VOC.

5.2. IDENTIFY ALL CONTROL TECHNOLOGIES

The first step in the BACT analysis is to identify the possible control technologies for each applicable pollutant for comparable emissions sources. For most source types, the EPA's RACT/BACT/LAER Clearinghouse (RBLC) is the preferred reference. Goodyear performed searches of the RBLC database in November 2014 to identify the emission control technologies that were imposed by permitting authorities as BACT within the past ten years for emission sources comparable to the proposed facility, and also based the list of potential control technologies on process knowledge and engineering experience of rubber mixing technologies. The summary of the search of the RBLC database conducted is included in Appendix C.

For VOC emissions, Goodyear has identified the control technologies listed in Table 5-1 as the commercially available controls for the mixing process, regardless of the industrial sector or process to be controlled. The control technologies for each pollutant were considered in order of decreasing emission reduction potential. It is noted that the emissions from the curing process are fugitive. The curing operations at Topeka are spread out over a very large area (approximately 3 acres). Further, the emissions of VOCs to the atmosphere from the curing operations are relatively dilute as they are part of the air inside the building which leaves the structure from the building ventilation systems. The large area over which the emissions evolve makes fume hoods technically infeasible for capturing emissions from these sources. Consequently, it would appear that the only feasible method for capturing the emissions would be to vent the exhausts from the entire structure to a Thermal Oxidizer. However, the low concentrations of VOCs in the resulting exhaust stream would make Thermal Oxidation technically infeasible. For these reasons, Goodyear does not believe that there are any technically feasible control options for the curing operations. Thus, a BACT analysis has not been performed for the existing curing operations.

Table 5-1. RBLC Listed Control Technologies

Pollutant	Listed Control Technologies
VOC	Regenerative Thermal Oxidation (RTO) Regenerative Catalytic Oxidation (RCO) Condensers Good Design/Operation

Of all the companies conducting rubber mixing operations in the United States, as identified in the RBLC, Goodyear is the only company that uses an RTO for VOC control (the control technology with the highest effective VOC control efficiency). Other companies were not required to install any add-on control technologies as part of the PSD-BACT review for the construction project.

Further, based on knowledge of the mixing processes at all the Goodyear facilities, the Goodyear Lawton Tire Plant in Lawton, Oklahoma has demonstrated the highest capture efficiency (of 84%) of the mixer to the RTO control device. The configuration of Mixer #1 will be identical to those utilized in Lawton. Both the rubber loading system and the rubber unloading system (twin-screw, roller-die) on the Topeka mixer will match those utilized in Lawton for coupling agent mixers. Furthermore, the ventilation system for the Topeka site will utilize a nearly identical control strategy. Therefore, as previously discussed, an equivalent capture efficiency of 84% is also expected for the proposed RTO at the Topeka facility. Therefore, Goodyear asserts that the proposed VOC controls will be equivalent to the best control technology currently being utilized at any other rubber mixing facility in the US.

Outside of the emissions control technologies listed above, the use of a total enclosure on Mixer #1 would allow for 100% capture of the emissions from the mixers to the RTO control device, which would exceed current acceptable BACT for similar operations.

5.3. ELIMINATION OF TECHNICALLY INFEASIBLE CONTROL OPTIONS

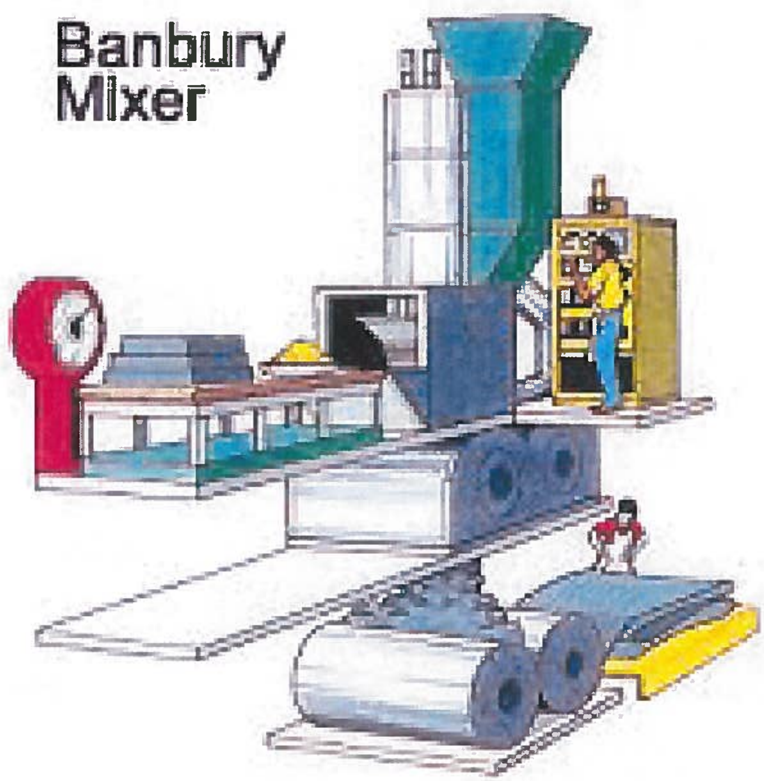
After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. As discussed in the previous section, the only control technology option that would allow for a greater VOC emission reduction than the originally proposed control strategy is the use of a total enclosure to an RTO control device. This section evaluates the technical feasibility of the use of a total enclosure control technology for reducing VOC emission from the mixer.

The mixer process is a batch operation which requires rather intensive operator interaction. Each batch requires the following process:

- Forklifts are used to deliver materials on pallets and in containers to the mixers. These materials must be staged near the feed conveyor for the operator's use.
- The operator manually cuts rubber slabs and places them onto a conveyor weight belt until the proper weight of rubber for the batch is achieved.
- The operator manually adds the contents of bags of various difference additives (carbon black, pigments, coupling agents, etc.) to the weight belt depending on the formulation required for the tire specifications.
- The operator presses a button to turn the conveyor on, which transfers the material from the weight belt to the mixer through a hopper.

- Process oils are injected at a certain interval within the mixing cycle, and the entire mixture is blended in batch mode.
- The mixed batch falls from the mixer onto a mill, a roller die extruder, or other device where is further blended.
- The batch is processed into either continuous slab rubber or into small pellets for rubber for temporary storage.

A schematic with a mixer similar to the proposed equipment is provided below as reference.



As demonstrated in the photo above, the mixer is a large piece of equipment which is approximately 2 stories high and has manual operations both upstream and downstream of the process. The structure required to create a total enclosure would be technically infeasible due to the size of the unit, associated piping, conveyors, personnel movement and the need for adequate air flow within the enclosure itself as well as to draw clean make-up air into the enclosure.

As specified in the EPA-CICA Fact Sheet for Permanent Total Enclosures (EPA-452-F-03-033) the installation would be infeasible due to the need for additional considerations in order to ensure worker comfort and meet OSHA standards for the operators working inside of the enclosure. It is expected that heat would build up within the enclosure due to the operation of the mixer, so worker exposure would be further complicated by any attempt to enclose the system.

Therefore, Goodyear has eliminated the use of a total enclosure for this installation because it is technically infeasible for the proposed process.

5.4. RANK CONTROL TECHNOLOGIES BY EFFECTIVENESS

The third of the five steps of the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. Table 5-2 lists the remaining technically feasible controls and their efficiencies. The control efficiency for an RTO controlling emissions from a mixer is documented in the RBLC database contained in Appendix C.

Table 5-2. Remaining Control Technologies Ranked By Effectiveness

Pollutant	Listed Control Technologies	Potential Control Effectiveness (%)
VOC	Regenerative Thermal Oxidation (RTO)	98%
	Regenerative Catalytic Oxidation (RCO)	95%
	Condensers	75%
	Good Design/Operation	Base Case

5.5. EVALUATION OF MOST STRINGENT CONTROLS

The fourth of the five steps in the top-down BACT assessment procedure is to evaluate the most effective control and document the results. During the evaluation of must stringent controls, two scenarios were taken into consideration: (1) Mixing without a coupling agent; and (2) Mixing with a coupling agent.

The annual emissions from Mixer #1 when a coupling agent is not used is 3.48 tons per year. At this low level of emissions, there is no economically feasible add-on control option for mixing without a coupling agent. Therefore, Goodyear will employ good design and operation as the economically feasible control option for mixing without a coupling agent. However, Goodyear will employ the most stringent control option, an RTO, for mixing with a coupling agent since all of the listed control technologies in Table 5-2 are feasible options for the Topeka facility, and an RTO has the greatest potential control effectiveness.

5.6. SELECT BACT FOR MIXING PROCESS

Based on steps 1 through 4 of the BACT analysis, Goodyear will install the proposed RTO as BACT for VOC emissions control since an RTO is the top tier control device for the removal of VOC.

Goodyear is proposing a BACT emission limit of 2.48 pounds per ton of throughput from the mixing operation through the use of an RTO during coupling agent usage and good design and operation when no coupling agent is used. This emission limit is equivalent to a 98% control efficiency for the RTO.

6. PRECONSTRUCTION AIR QUALITY ANALYSIS

K.A.R. 28-19-350 incorporates by reference the preconstruction air quality analysis requirement for modifications for each pollutant, which results in a significant net emissions increase. As part of the preconstruction air quality analysis, if existing representative air quality monitoring data is not available, the facility may be required to establish a site-specific air quality network. VOC, which is a precursor to ozone, is the only pollutant that is increasing in a significant quantity as a result of this project. Therefore, there are no air dispersion modeling requirements associated with the project. Modeling results are frequently used to determine if a proposed project results in impacts in excess of the significant monitoring concentrations (SMC) for affected pollutants and thus if pre-construction monitoring should be considered. In the absence of modeling results that could be used to estimate project impacts on surrounding air quality, a qualitative approach can be used to assess the need for additional monitoring.

It is Goodyear's understanding that the KDHE recognizes that the process of operating a monitoring network and collecting ambient data for up to one year prior to the submittal of a complete PSD application for the Topeka facility is an unnecessary burden for Goodyear. For the purposes of this project, the chance of exceeding the National Ambient Air Quality Standard (NAAQS) for ozone with the associated VOC emission increases is negligible for the Topeka, KS area. VOC is not currently a major concern in Topeka and when high ozone episodes are recorded in the Topeka vicinity it is typically due to open burning in the Flint Hills.

There is an existing air quality monitor located at 2501 Randolph Avenue in Topeka, KS, which is less than 10 miles from the Topeka site. Figure 1 shows the monitor in relation to the Goodyear site.

Figure 1. Nearest Ozone Monitor to Goodyear Topeka Facility

Selection of an existing monitoring station that is "representative" of the ambient air quality in the area surrounding the Goodyear Topeka facility was determined based on the following three criteria:

1. Monitor location,
2. Data quality, and
3. Data currentness.

Key considerations based on the monitor location criteria include proximity to the significant impact area of the facility, similarity of emission sources impacting the monitor to the emission sources impacting the airshed surrounding the facility, and the similarity of the land use and land cover (LULC) surrounding the monitor and facility. The data quality criteria refers to the monitor being an approved SLAM or similar monitor type subject to the quality assurance requirements in 40 CFR Part 58 Appendix A. Data currentness refers to the fact that the most recent three complete years of quality assured data are generally preferred. This monitor is in a very similar rural-suburban topographic setting and has data available up through calendar year 2014.

Given the proximity and topographic similarities between the facility and monitor, along with the availability of very recent, complete data, Goodyear determined the 2501 Randolph Avenue monitor to be representative of the air quality at the Topeka site. The projected VOC emissions increases from the Topeka site as a result of this project are not expected to impact the ozone levels in the region such that it will affect the NAAQS compliance status of the region. Given that and the fact that ozone is a regional pollutant, Goodyear asserts that the 2501 Randolph Avenue monitor which is less than 10 miles from the Topeka site sufficiently characterizes the ozone in the region surrounding the Topeka facility and as such, fulfills the requirements set forth under NSR and the KDHE regulations.

Based on the reasons described above, combined with the fact that the preconstruction monitoring requirement would impose a substantial and unnecessary burden on Goodyear, the facility elects to use existing monitoring data from the 2501 Randolph Avenue monitor in lieu of showing that the facility is exempted from the preconstruction monitoring requirement based on modeling, which is rarely conducted to determine ozone impacts from an individual source.

7. CLASS I AREA ANALYSIS

Sections 160-169 of the Clean Air Act (CAA), as amended by the Clean Air Act Amendments of 1990, establish a detailed policy and regulatory program to protect the quality of the air in regions of the United States in which the air is cleaner than required by the National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. One of the purposes of the PSD program is "to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value."

Under the PSD provisions, Congress established a land classification scheme for those areas of the country with the quality better than the NAAQS. Class I allows very little deterioration of air quality and includes:

- international parks;
- national wilderness areas which exceed 5,000 acres in size;
- national memorial parks which exceed 5,000 acres in size; and
- national parks which exceed six thousand acres in size.

All other areas are designated as *Class II* areas and do not require emissions increments. The closest Class I area to Goodyear Topeka is the Hercules-Glades Wilderness Area in southern Missouri which is located approximately 330 km southeast of the Goodyear facility.

Class I analyses, when requested, typically include a Class I PSD Increment Assessment for NO_x, SO_2, and PM_{10}, and an Air Quality Related Values (AQRV) assessment including a visibility analysis for increases in visibility impairing pollutants and a deposition analysis for nitrogen and sulfur deposition.

In October 2010, The Federal Land Managers AQRV Workgroup (FLAG) Phase I Report – Revised (FLAG 2010) set a threshold ratio of emissions to distance, below which AQRV review is not required for sources located greater than 50 km from a Class I area. Specifically, if:

$$Q\ (\text{tpy}) / d\ (\text{km}) < 10, \text{ no AQRV analysis is required}$$

Q is the combined emissions increase of sulfur dioxide (SO_2), oxides of nitrogen (NO_X), particulate matter less than 10 microns (PM_{10}), and sulfuric acid mist (H_2SO_4) in tons per year (tpy) based on 24-hour maximum allowable emissions (which are annualized) and d is the nearest distance to a Class I area in kilometers (km). Goodyear has performed a Q/D analysis for the Hercules-Glades Wilderness Area to demonstrate that no visibility impacts will occur at this Class I area as the Q/D value is well below 10.

$$Q = 2.15\ \text{tpy}\ (NO_X) + 0.01\ \text{tpy}\ (SO_2) + 0.52\ \text{tpy}\ (PM_{10}) = 2.68\ \text{tpy}$$
$$d = 330\ \text{km}$$

$$\frac{Q}{d} = 0.0081$$

Therefore, Goodyear anticipates that a Class I Area analysis will not be required for the proposed project.

8. ADDITIONAL IMPACT ANALYSIS

8.1. AIR QUALITY ANALYSIS

An ambient air impacts analysis will not be performed for the project because VOCs are not modeled for NAAQS or PSD Increment compliance purposes. Furthermore, the KDHE does not have an Air Toxics program.

8.2. GROWTH IMPACTS

A growth analysis is intended to quantify the amount of new growth that is likely to occur in support of the facility and to estimate emissions resulting from that associated growth. Associated growth includes residential and commercial/industrial growth resulting from the new facility. Residential growth depends on the number of new employees and the availability of housing in the area, while associated commercial and industrial growth consists of new sources providing services to the new employees and the facility. Goodyear does not anticipate that additional personnel will be employed to aid the increased coupling agent usage and mixer upgrades. Therefore, additional growth from this project is expected to be minimal.

8.3. SOILS AND VEGETATION

The following discussion will review the project's potential to impact its agricultural surroundings based on the facility's allowable emission rates and resulting ground level concentrations of VOC.

The effects of gaseous air pollutants on vegetation may be classified into three rather broad categories: acute, chronic, and long-term. Acute effects are those that result from relatively short (less than 1 month) exposures to high concentrations of pollutants. Chronic effects occur when organisms are exposed for months or even years to certain threshold levels of pollutants. Long-term effects include abnormal changes in ecosystems and subtle physiological alterations in organisms. Acute and chronic effects are caused by the gaseous pollutant acting directly on the organism, whereas long-term effects may be indirectly caused by secondary agents such as changes in soil pH.

VOCs are regulated by the U.S. EPA as precursors to tropospheric ozone. Elevated ground-level ozone concentrations can damage plant life and reduce crop production. Some chemical species of VOCs may have an impact on soils and vegetation near the emissions source if emissions are large enough. VOCs can interfere with the ability of plants to produce and store food, making them more susceptible to disease, insects, other pollutants, and harsh weather. Ethanol is the primary VOC emitted as part of the proposed project. While ethanol is a volatile organic compound, it is not toxic and is not listed on EPA's HAP list. In fact, byproduct from ethanol manufacturing facilities is used as feed for livestock. It is also noted, that VOC is not currently a major concern in Topeka and when high ozone episodes are recorded in the Topeka vicinity it is typically due to open burning in the Flint Hills. For these reasons it is anticipated the project will not have a significant impact on soils and vegetation in the surrounding area.

8.4. VISIBILITY IMPAIRMENT

The project is not expected to produce any perceptible visibility impacts in the immediate vicinity of the plant. Given the limitation of 20% opacity of emissions, and a reasonable expectation that normal operation of the Topeka Plant will result in < 10% opacity, no immediate visibility impairment is anticipated.

9. CONSTRUCTION PERMIT APPLICATION FORMS

Kansas Department of Health and Environment
Bureau of Air and Radiation

PUBLIC VERSION

Phone (785) 296-1570 Fax (785) 291-3953

Notification of Construction or Modification

(K.A.R. 28-19-300 Construction permits and approvals; applicability)

Check one: ☐Applying for a Permit under K.A.R. 28-19-300(a) ☒Applying for an Approval under K.A.R. 28-19-300(b)*

1) Source ID Number: 1770007

RECEIVED
AUG 07 2015
BUREAU OF AIR

2) Mailing Information:
Company Name: The Goodyear Tire & Rubber Co
Address: P.O. Box 1069
City, State, Zip: Topeka, KS 66601

3) Source Location:
Street Address: 2000 Northwest US Highway 24
City, County, State, Zip: Topeka, Shawnee, KS, 66618
Section, Township, Range: S13 T11S R15E
Latitude & Longitude Coordinates: 39.09, -95.69

4) NAICSC/SIC Code (Primary): 326211 / 3011

5) Primary Product Produced at the Source: Rubber Tires

6) Would this modification require a change in the current operating permit for your facility? • Yes • No

If no, please explain:

7) Is a permit fee being submitted? • Yes • No

The fee was included with the first submittal of this application. This submittal serves as a revision to the first submittal of this permit application.

If yes, please include the facility's federal employee identification number (FEIN #) 34-0253240

8) Person to Contact at the Site: Curt Deitz Phone: (785) 295-7466
Title: Environmental Manager

9) Person to Contact Concerning Permit: Curt Deitz Phone: (785) 295-7466
Title: Environmental Manager
Email: curt_deitz@goodyear.com Fax: (785) 295-7172

Please read before signing:

Reporting forms provided may not adequately describe some processes. Modify the forms if necessary. Include a written description of the activity being proposed, a description of where the air emissions are generated and exhausted and how they are controlled. A simple diagram showing the proposed activity addressed in this notification which produces air pollutants at the facility (process flow diagrams, plot plan, etc.) with emission points labeled must be submitted with reporting forms. Information that, if made public, would divulge methods or processes entitled to protection as trade secrets may be held confidential. See the reverse side of this page for the procedure to request information be held confidential. A copy of the Kansas Air Quality Statutes and Regulations will be provided upon request.

Name and Title Marcelo D'Aprile, Engineering Manager
Address: 2000 Northwest US Highway 24, Topeka, Kansas 66618

Signature: ______________ Date: 08 / 05 / 2015 Phone: (785) 295-7466

* If you do not know whether to apply for a permit or an approval, follow approval application procedures.

Procedures For Requesting Information To Be Held Confidential

March 15, 2006
Revision 6

Kansas Department of Health and Environment
Division of Environment
Bureau of Air and Radiation

TIRE MANUFACTURING

1) Source ID Number: 1770007

2) Company/Source Name: The Goodyear Tire & Rubber Co

3) Emission Unit Identification: #1 Mixer (EU-MX01)

4) Normal Operating Schedule: 8,736 hrs/yr

5) Capacity: 157 tires/hr; 1,374,118 tires/yr

6) Preparation or Compounding of Raw Material:

Banbury Mixing Systems:

Manufacturer: Kobelco Stewart Bolling, Inc.
Date of Manufacture: September 27, 2010
Model No.: BB370
Maximum Rated Capacity: * lb/hr
Date of Latest Modification: TBD

List ingredients added to mixer:

Material	Physical State	lb/hr
Rubber	Solid	20,667
Coupling Agent	Solid, Liquid	*Refer to attached calculation tables for throughput data

Describe method of disposal of collected materials: The #1 Mixer and the carbon black handling process associated with the #1 Mixer are currently controlled by dust collectors CE-MX01DC and CE-MX01CH, respectively. These dust collectors are currently in operation and permitted in the June 16, 2014 Construction Approval. As such, this application does not include a Fabric Filter/Baghouse form for CE-MX01DC or CE-MX01CH.

Describe method used in unloading and conveying of ingredients into storage hoppers or silos:
Covered by EU-MX01CH. EU-MX01CH is currently in operation and permitted in the June 16, 2014 Construction Approval. As such, this application does not include a Raw Material and Storage form for EU-MX01CH.

*Requested hourly mixed rubber throughput (i.e. 20,667 lb/hr) remains consistent with 2014 Construction Approval Application.

TIRE MANUFACTURING
(cont.)

7) Transformation of Compound: N/A*

Untreaded Cementing:

No. of Machines: ______

Complete the following solvent or cement information pertaining to the composition of liquid, % liquid by weight, and volume and estimated annual usage:

Composition of Liquid		% Liquid (Weight)		% Liquid (Volume)		Annual Consumption
______	-	______	-	______	-	______
______	-	______	-	______	-	______
______	-	______	-	______	-	______
______	-	______	-	______	-	______
______	-	______	-	______	-	______
______	-	______	-	______	-	______

Density of solvent: ______lb/gal

Describe waste solvent disposal method: ______________________________

8) Tire Assembly: N/A*

Calendaring:

No. of machines: ______

Bead Dipping - Tire Building - Tread End Cementing - Green Tire Spraying:

No. of machines in the Tire Building process: ______

No. of machines in the Green Tire Spraying process: ______

In Green Tire Spraying process, indicate type of solvent used: Organic ______; Water-based ______

*No new equipment associated with these processes will be constructed as part of the proposed project.

TIRE MANUFACTURING
(cont.)

Complete the following solvent or cement information pertaining to the composition of liquid, % liquid by weight, and volume and estimated annual usage:

Process	Composition of Liquid	% Liquid (Weight)	% Liquid (Volume)	Annual Consumption	Density of Solvent
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal
					lb/gal

Exit gas flow rate in bead dipping process: ______cfm

Describe waste solvent disposal method from the above processes: ______________________________

9) For emission control equipment, use the appropriate CONTROL EQUIPMENT form and duplicate as needed. Be sure to indicate the emission unit that the control equipment is affecting.

10) Did construction, modification, or reconstruction commence after January 20, 1983? Yes ☐ No ☑
If yes, this plant may be subject to NSPS, 40 CFR Part 60, Subpart BBB.

Kansas Department of Health and Environment
Division of Environment
Bureau of Air and Radiation

AFTERBURNER/INCINERATOR

1) Source ID Number: 1770007

2) Company/Source Name: The Goodyear Tire & Rubber Co

3) Afterburner/Incinerator identification number or designation: CE-MX1RTO

4) What emission unit(s) or source(s)of emissions is(are) vented to the afterburner/incinerator?
   a. #1 Mixer (EU-MX01)
   b. ______
   c. ______
   d. ______

5) Description of pollutant(s) collected: Volatile Organic Compounds

6) Type of Incineration: Catalytic N/A; Noncatalytic ______; Other ______
   If Catalytic, what type is used? ______

7) Manufacturer: TBD
   Date of Manufacture: TBD
   Model No.: TBD
   Rated Control Efficiency: 98 %
   Capture Efficiency: 84 %
   Date of Installation: TBD

8) Volume of gas cleaned: TBD cfm

9) Is there a device provided to measure temperature? Yes ☑; No ☐
   If yes, complete the following:
   Temperature Gauge: TBD °F *

10) Inlet Temperature of gas cleaned: TBD °F

AFTERBURNER/INCINERATOR
(cont.)

11) Inlet concentration: TBD ppm or grains/cu. ft.

12) Outlet concentration: TBD ppm or grains/cu. ft.

13) Outlet Minimum Temperature Maintained: TBD °F

14) Retention time at this temperature: TBD sec. *

15) Number of burners: 3

16) Capacity of burners: 5 MMBtu/hr

17) Primary Fuel: Type Natural Gas ; Amount burned/hr. 3 MMcf/hr

18) Secondary Fuel: Type N/A ; Amount burned/hr. ______

19) Description of material to be incinerated: The RTO will control the ethanol (i.e. VOC) emissions resulting from the use of coupling agent in the mixing process associated with the #1 Mixer.

20) Emission discharge to atmosphere TBD ft. above grade through stack or duct TBD diameter at TBD °F temperature, with TBD cfm flow rate and TBD fps velocity.

*Goodyear will determine the necessary combustion chamber temperature and retention time required to ensure 98% control of VOC from the #1 Mixer after installation of the RTO.

APPENDIX A: AREA MAP

Goodyear Tire & Rubber Co – Topeka Plant

Trinity Consultants

APPENDIX B: DETAILED EMISSION CALCULATIONS

Goodyear Topeka
Emissions Summary

Project Emissions Increase Summary

Source	Total PM (tpy)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	NO_X (tpy)	Lead (tpy)	CO_2e (tpy)
Potential Emissions from New/Modified Units									
Scenario 1 - High Temperature Coupling Agent:									
Mixer 1[1,2]	0.36	0.36	0.36	--	353.72	--	--	-1.63E-08	--
RTO - Natural Gas Usage	0.16	0.16	0.16	1.80	0.12	0.01	2.15	1.07E-05	2,591.78
Scenario 1 - Total	*0.52*	*0.52*	*0.52*	*1.80*	*353.84*	*0.01*	*2.15*	*1.07E-05*	*2,591.78*
Scenario 2 - Low Temperature Coupling Agent:									
Mixer 1[1,2]	0.36	0.36	0.36	--	510.66	--	--	-1.63E-08	--
RTO - Natural Gas Usage	0.16	0.16	0.16	1.80	0.12	0.01	2.15	1.07E-05	2,591.78
Scenario 2 - Total	*0.52*	*0.52*	*0.52*	*1.80*	*510.78*	*0.01*	*2.15*	*1.07E-05*	*2,591.78*
Total[3]	0.52	0.52	0.52	1.80	510.78	0.01	2.15	0.00	2591.78
Net Emission Increase	0.52	0.52	0.52	1.80	510.78	0.01	2.15	1.07E-05	2,591.78
SER	25	15	10	100	40	40	40	0.6	75,000
Exceeds	No	No	No	No	**Yes**	No	No	No	No

[1]Includes controlled emissions from the mixing operations and fugitive emissions from the curing operations.

[2]The emission increase associated with Mixer 1 is calculated by subtracting baseline emissions from future potential emissions. Baseline emissions from Mixer 1 included the mixing of all rubber components. Future potential emissions allocate 100% of the annual throughput estimated for Mixer 1 to mixing the ethanol emitting rubber. There is no RMA emission factor for lead from the ethanol emitting rubber, however, so the calculated emission increase for lead is negative.

[3]VOC emissions from Mixer 1 are based on Scenario 2, which yields the overall worst-case emissions for the mixing and curing processes combined.

PUBLIC VERSION

Baseline Actuals -

Mixer 1 - Rubber Throughputs

Year	Mixed Rubber Throughput[1] (lb/yr)	Annual Operating Time[2] (days/yr)	Exported Rubber[3] (lb/yr)	Cured Rubber Throughput (lb/yr)
2012	10,950	325	0	10,950
2013	1,176,634	325	454,545	722,089

[1]Provided by Curt Deitz in an e-mail dated June 4, 2014.

[2]Based on annual operating hours reported in the R.Y. 2012 and 2013 AEIs.

[3]Provided by Curt Deitz on July 9, 2014.

Mixer 1 - Rubber Throughput Breakdown

Rubber Component[1]	% of Total Throughput[2]	2012 Mixed Rubber Throughput (lb/yr)	2013 Mixed Rubber Throughput (lb/yr)
Inner Liner	5.77%	632	67,915
Belt Coat	18.49%	2,025	217,583
Base/Sidewall	17.27%	1,891	203,228
Apex/Beads	14.00%	1,533	164,752
Tread	44.46%	4,869	523,155

[1]Goodyear Topeka receives all ply belt and bladder from other Goodyear facilities. Therefore, these components are not accounted for in the breakdown above.

[2]Based on Goodyear Topeka data. Consistent with AEI.

Mixer 1 - Dust Collector Control Efficiency[1]

99 %

[1]Based on control efficiency as permitted in the October 17, 2011 construction approval.

Future Potentials -

Mixer 1 - Mixed and Cured Rubber Throughputs and Dust Collector Control Efficiency

Maximum Operating Days (days/yr)	Potential Mixed Rubber Throughput[1] (lb/yr)	Potential Cured Rubber Throughput (lb/yr)	Dust Collector Control Efficiency[2] (%)
365	181,040,000	181,040,000	99

[1]Based on mixed rubber throughput of 496,000 lbs/day as permitted in the October 17, 2011 construction approval (modified on June 16, 2014).

[2]Based on control efficiency as permitted in the October 17, 2011 construction approval (modified on June 16, 2014).

Mixer 1 - Mixed Rubber Throughput Breakdown

Rubber Component[1]	% of Total Throughput	Mixed Rubber Throughput (lb/yr)
Ethanol Emitting Rubber	100%	181,040,000

[1]As a conservative estimate, it is assumed coupling agent will be used 100% of the time on Mixer 1. Coupling agent is only used when mixing ethanol emitting rubber. Thus, the emission calculations presented here allocate 100% of the annual throughput estimated for Mixer 1 to mixing ethanol emitting rubber.

Mixer 1 - Coupling Agent Parameters [1]

Process	Liquid Coupling Agent: Productive Maximum Usage Rate[1] (lb coupling agent/ lb rubber)	Liquid Coupling Agent: VOC Content[2] (lb VOC/ lb coupling agent)	Solid Coupling Agent: Productive Maximum Usage Rate[1] (lb coupling agent/ lb rubber)	Solid Coupling Agent: VOC Content[2] (lb VOC/ lb coupling agent)	Percent VOC Emissions from Mixing[3]	Percent VOC Emissions from Curing[3]
High Temperature[4]	0.024	0.388	0.048	0.194	75	25
Low Temperature[5]	0.0195	0.342	0.039	0.171	25	75

[1]Based on proposed rubber batches for high temperature scenarios and current rubber batches for low temperature scenarios. For both the high and low temperature scenarios, solid coupling agent is 50% the strength of the liquid coupling agent, but Goodyear Topeka is estimated to use two times the amount as will be used of the liquid coupling agents. Estimates are consistent with Goodyear Danville.

[2]Based on VOC contents from MSDSs of representative liquid and solid coupling agents projected to be used on Mixer 1.

[3]Based on Goodyear data. Consistent with AEI.

[4]Drop temperatures greater than 300°F.

[5]Drop temperatures between 250°F and 300°F.

Goodyear Topeka
Baseline Actual Criteria Pollutant Emissions - Mixer #1

PUBLIC VERSION

Mixing RMA Emission Factors

Mixed Rubber Types	VOC Emission Factor[1] (lb/lb rubber)	PM / PM_{10} / $PM_{2.5}$ Emission Factor[1,2] (lb/lb rubber)	Emission Factor Origin
Inner Liner	5.55E-05	1.58E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #1
Belt Coat	1.22E-04	8.10E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #3
Base/Sidewall	3.49E-05	2.70E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #4
Apex/Beads	1.94E-04	8.33E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #5
Tread	3.48E-05	3.60E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #6

[1]Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been multiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.
[2]RMA only provides mixing emission factors for total particulate (i.e. PM). Emission factors for PM10 and PM2.5 are not available. Therefore, it is conservatively assumed PM10 and PM2.5 are equivalent to PM.

Mixer 1 - Mixing VOC Emissions

Mixed Rubber Types	2012 Uncontrolled VOC Emissions (tons/yr)	2012 Uncontrolled VOC Emissions (lb/hr)	2013 Uncontrolled VOC Emissions (tons/yr)	2013 Uncontrolled VOC Emissions (lb/hr)	2012 - 2013 24-Month Total (tons/yr)	2012 - 2013 Baseline Emissions (ton/yr)
Inner Liner	1.75E-05	4.50E-06	1.88E-03	4.83E-04	4.42E-02	2.21E-02
Belt Coat	1.24E-04	3.17E-05	1.33E-02	3.41E-03		
Base/Sidewall	3.30E-05	8.46E-06	3.55E-03	9.09E-04		
Apex/Beads	1.48E-04	3.81E-05	1.60E-02	4.09E-03		
Tread	8.46E-05	2.17E-05	9.10E-03	2.33E-03		
Total	4.07E-04	1.04E-04	4.38E-02	1.12E-02		

Mixer 1 - Mixing PM/PM_{10}/$PM_{2.5}$ Emissions

Mixed Rubber Types	2012 Uncontrolled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (tons/yr)	2012 Uncontrolled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (lb/hr)	2012 Controlled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (tons/yr)	2012 Controlled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (lb/hr)	2013 Uncontrolled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (tons/yr)	2013 Uncontrolled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (lb/hr)	2013 Controlled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (tons/yr)	2013 Controlled PM / PM_{10} / $PM_{2.5}$ Emissions[1] (lb/hr)	2012 - 2013 24-Month Total (tons/yr)	2012 - 2013 Baseline Emissions (ton/yr)
Inner Liner	4.98E-05	1.28E-05	4.98E-07	1.28E-07	5.35E-03	1.37E-03	5.35E-05	1.37E-05	2.86E-03	1.43E-03
Belt Coat	8.20E-04	2.10E-04	8.20E-06	2.10E-06	8.81E-02	2.26E-02	8.81E-04	2.26E-04		
Base/Sidewall	2.55E-04	6.55E-05	2.55E-06	6.55E-07	2.74E-02	7.03E-03	2.74E-04	7.03E-05		
Apex/Beads	6.38E-04	1.64E-04	6.38E-06	1.64E-06	6.86E-02	1.76E-02	6.86E-04	1.76E-04		
Tread	8.76E-04	2.25E-04	8.76E-06	2.25E-06	9.42E-02	2.41E-02	9.42E-04	2.41E-04		
Total	2.64E-03	6.77E-04	2.64E-05	6.77E-06	2.84E-01	7.27E-02	2.84E-03	7.27E-04		

[1]RMA only provides mixing emission factors for total particulate (i.e. PM). Emission factors for PM10 and PM2.5 are not available. Therefore, it is conservatively assumed PM10 and PM2.5 are equivalent to PM.

Mixer 1 - Curing Emissions

Process	RMA VOC Emission Factor[1] (lb/lb rubber)	2012 Fugitive VOC Emission Factor from Curing Mold Releases[2] (lb/lb rubber)	2013 Fugitive VOC Emission Factor from Curing Mold Releases[2] (lb/lb rubber)	2012 Uncontrolled VOC Emissions (tons/yr)	2012 Uncontrolled VOC Emissions (lb/hr)	2013 Uncontrolled VOC Emissions (tons/yr)	2013 Uncontrolled VOC Emissions (lb/hr)	2012 - 2013 24-Month Total (tons/yr)	2012 - 2013 Baseline Emissions (ton/yr)
Curing	3.37E-04	2.70E-06	1.53E-06	1.86E-03	4.78E-04	1.22E-01	3.14E-02	1.24E-01	6.21E-02

[1]AP-42, Table 4.12-11 DRAFT (6/99) - Tire A
[2]Based on the amounts of curing mold release agents used and their respective VOC contents as reported in the R.Y. 2012 and 2013 AEIs

Mixing RMA Emission Factors [1]

Mixed Rubber Types	RMA VOC Emission Factor[1] (lb/lb rubber)	$PM / PM_{10} / PM_{2.5}$ Emission Factor[1,2] (lb/lb rubber)	Emission Factor Origin
Ethanol Emitting Rubber	3.86E-05	4.00E-04	AP-42, Table 4.12-4 DRAFT (6/99) - Cmpd #6

[1]The emission factors presented in the RMA mixing emission factor table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. For permitting purposes it is assumed Mixer 1 will mix both productive and non-productive rubber in the future. Thus, the emission factor presented above represents the combined emission factor for productive and non-productive mixing.

[2]RMA only provides mixing emission factors for total particulate (i.e. PM). Emission factors for PM10 and PM2.5 are not available. Therefore, it is conservatively assumed PM10 and PM2.5 are equivalent to PM.

Mixer 1 - Mixing Emissions

Mixed Rubber Types	Potential Uncontrolled VOC Emissions (tons/yr)	Potential Uncontrolled VOC Emissions (lb/hr)	Potential Controlled VOC Emissions (tons/yr)	Potential Controlled VOC Emissions (lb/hr)	Uncontrolled $PM / PM_{10} / PM_{2.5}$ Emissions[1] (tons/yr)	Uncontrolled $PM / PM_{10} / PM_{2.5}$ Emissions[1] (lb/hr)	Potential Controlled $PM / PM_{10} / PM_{2.5}$ Emissions[1] (tons/yr)	Potential Controlled $PM / PM_{10} / PM_{2.5}$ Emissions[1] (lb/hr)
Ethanol Emitting Rubber	3.50	0.80	0.62	0.14	36.21	8.27	0.36	0.08

[1]RMA only provides mixing emission factors for total particulate (i.e. PM). Emission factors for PM10 and PM2.5 are not available. Therefore, it is conservatively assumed PM10 and PM2.5 are equivalent to PM.

Mixer 1 - Curing Emissions

Process	RMA VOC Emission Factor[1] (lb/lb rubber)	Emission Factor from Curing Mold Releases[2] (lb/lb rubber)	Potential Uncontrolled VOC Emissions (tons/yr)	Potential Uncontrolled VOC Emissions (lb/hr)
Curing	3.37E-04	1.53E-06	30.68	7.01E+00

[1]AP-42, Table 4.12-11 DRAFT (6/99) - Tire A

[2]Based on the amounts of curing mold release agents used and their respective VOC contents as reported in the R.Y. 2013 AEI.

Mixer 1 - High Temperature Coupling Agent Emissions [1,2]

Process	Potential Uncontrolled VOC Emissions (tons/yr)	Potential Uncontrolled VOC Emissions (lb/hr)	Potential Controlled VOC Emissions (tons/yr)	Potential Controlled VOC Emissions (lb/hr)
Mixing	632.19	144.34	111.77	25.52
Curing	210.73	48.11	210.73	48.11
Total	842.92	192.45	322.50	73.63

[1]As a conservative estimate, the emission calculations presented here allocate 100% of the annual throughput assumed for Mixer 1 to mixing ethanol emitting rubber. Thus, it is assumed coupling agent will be used 100% of the time in Mixer 1.

[2]VOC emissions are based on the coupling agent type (i.e. liquid coupling agent versus solid coupling agent) that yields the worst-case emissions.

Mixer 1 - Low Temperature Coupling Agent Emissions [1,2]

Process	Potential Uncontrolled VOC Emissions (tons/yr)	Potential Uncontrolled VOC Emissions (lb/hr)	Potential Controlled VOC Emissions (tons/yr)	Potential Controlled VOC Emissions (lb/hr)
Mixing	150.92	34.46	26.68	6.09
Curing	452.76	103.37	452.76	103.37
Total	603.68	137.83	479.44	109.46

[1]As a conservative estimate, the emission calculations presented here allocate 100% of the annual throughput assumed for Mixer 1 to mixing ethanol emitting rubber. Thus, it is assumed coupling agent will be used 100% of the time in Mixer 1.

[2]VOC emissions are based on the coupling agent type (i.e. liquid coupling agent versus solid coupling agent) that yields the worst-case emissions.

Goodyear Topeka

Potential Criteria Pollutant Emissions - RTO

RTO Specifications

Maximum Heat Input[1] (MMBtu/hr)	Higher Heating Value of Natural Gas[2] (Btu/scf)	Natural Gas Throughput (Mscf/yr)	RTO Control Efficiency [3] (%)	RTO Capture Efficiency [3] (%)
5	1,020	42,941	98	84

[1]Maximum heat input based on estimated heat input of 5 MMBtu/hr per mixer. This assumption is consistent with that of the other Goodyear facilities. The RTO at Goodyear Topeka will be sized for one mixer.

[2]Based on default higher heating value for natural gas from AP-42, 5th Edition, Table 1.4-1, Footnote a, 7/98.

[3]Based on specifications for similar RTO being installed at Goodyear Danville.

RTO Emissions

Pollutant	Emission Factor[1] (lb/MMscf)	Potential Emissions (tpy)	Potential Emissions (lb/hr)
PM[12]	7.6	0.16	0.04
PM_{10}[12]	7.6	0.16	0.04
$PM_{2.5}$[12]	7.6	0.16	0.04
SO_2[1]	0.6	0.01	0.00
NOx[3]	100	2.15	0.49
VOC[1]	5.5	0.12	0.03
CO[3]	84	1.80	0.41
CO_2[1]	120,000	2,576.47	588.24
CH_4[1]	2.3	0.05	0.01
N_2O[14]	2.2	0.05	0.01
CO_2e[5]	--	2,591.78	591.73

[1]AP-42, 5th Edition, Table 1.4-2, 7/98.

[2]Assume PM_{10} and $PM_{2.5}$ are equivalent to PM based on AP-42, 5th Edition, Table 1.4-2, Footnote c, 7/98 which states all PM is assumed to be less than 1.0 micrometer in diameter.

[3]AP-42, 5th Edition, Table 1.4-1, 7/98. Used emission factors for Uncontrolled Small Boilers less than 100 MMBtu/hr.

[4]Used uncontrolled emission factor.

[5]CO_2e calculations based on global warming potential of 1 for CO_2, 25 for CH_4, and 298 for N_2O, from 40 CFR Subpart 98, Table A-1.

Goodyear Topeka

Potential Criteria Pollutant Emissions - RTO

RTO HAP Emissions

Pollutant	CAS#	Emission Factor (lb/MMscf)	Potential Emissions (tpy)	Potential Emissions (lb/yr)
2-Methylnapthalene[1,2]	91-57-6	2.40E-05	5.15E-07	1.18E-07
3-Methylchloranthrene[1,2]	56-49-5	1.80E-06	3.86E-08	8.82E-09
7,12-Dimethylben(a)anthrancene[1,2]		1.60E-05	3.44E-07	7.84E-08
Acenaphthene[1,2]	83-32-9	1.80E-06	3.86E-08	8.82E-09
Acenphthylene[1,2]	203-96-8	1.80E-06	3.86E-08	8.82E-09
Anthracene[1,2]	120-12-7	2.40E-06	5.15E-08	1.18E-08
Arsenic[3]	7440-38-2	2.00E-04	4.29E-06	9.80E-07
Benz(a)anthracene[1,2]	56-55-3	1.80E-06	3.86E-08	8.82E-09
Benzene[1]	71-43-2	2.10E-03	4.51E-05	1.03E-05
Benzo(a)pyrene[1,2]	50-32-8	1.20E-06	2.58E-08	5.88E-09
Benzo(b)fluoranthene[1,2]	205-99-2	1.80E-06	3.86E-08	8.82E-09
Benzo(g,h,i)perylene[1,2]	191-24-2	1.20E-06	2.58E-08	5.88E-09
Benzo(k)fluoranthene[1,2]	205-82-3	1.80E-06	3.86E-08	8.82E-09
Beryllium[3]	7440-41-7	1.20E-05	2.58E-07	5.88E-08
Cadmium[3]	7440-43-9	1.10E-03	2.36E-05	5.39E-06
Chromium[3]	7440-47-3	1.40E-03	3.01E-05	6.86E-06
Chrysene[1,2]	218-01-9	1.80E-06	3.86E-08	8.82E-09
Cobalt[3]	7440-48-4	8.40E-05	1.80E-06	4.12E-07
Dibenzo(a,h)anthracene[1,2]	53-70-3	1.20E-06	2.58E-08	5.88E-09
Dichlorobenzene[1]	25321-22-6	1.20E-03	2.58E-05	5.88E-06
Fluoranthene[1,2]	206-44-0	3.00E-06	6.44E-08	1.47E-08
Fluorene[1,2]	86-73-7	2.80E-06	6.01E-08	1.37E-08
Formaldehyde[1]	50-00-0	7.50E-02	1.61E-03	3.68E-04
Hexane[1]	110-54-3	1.80E+00	3.86E-02	8.82E-03
Indeno(1,2,3-cd)pyrene[1,2]	193-39-5	1.80E-06	3.86E-08	8.82E-09
Lead[4]	7439-92-1	5.00E-04	1.07E-05	2.45E-06
Manganese[3]	7439-96-5	3.80E-04	8.16E-06	1.86E-06
Mercury[3]	7439-97-6	2.60E-04	5.58E-06	1.27E-06
Naphthalene[1]	91-20-3	6.10E-04	1.31E-05	2.99E-06
Nickel[3]	7440-02-0	2.10E-03	4.51E-05	1.03E-05
Phenanathrene[1,2]	85-01-8	1.70E-05	3.65E-07	8.33E-08
Pyrene[1,2]	129-00-0	5.00E-06	1.07E-07	2.45E-08
Selenium[3]	7782-49-2	2.40E-05	5.15E-07	1.18E-07
Toluene[1]	108-88-3	3.40E-03	7.30E-05	1.67E-05
Polycyclic Organic Matter (POM)[2]		--	1.89E-06	4.32E-07

[1] AP-42, 5th Edition, Table 1.4-3, 7/98. Emissions factors listed as "<" value are conservatively assumed to be equal to the high end of the range listed.

[2] POM Polycyclic Organic Matter (POM).

[3] AP-42, 5th Edition, Table 1.4-4, 7/98. Emissions factors listed as "<" value are conservatively assumed to be equal to the high end of the range listed.

[4] AP-42, 5th Edition, Table 1.4-2, 7/98.

Mixer 1 - 2012 Mixing Emissions - Inner Liner [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	2012 Controlled HAP Emissions[3] (tons/yr)	2012 Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	8.80E-08	2.78E-08	7.13E-09	2.78E-08	7.13E-09
1,4-Dichlorobenzene	106-46-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	78-93-3	5.32E-06	1.68E-06	4.31E-07	1.68E-06	4.31E-07
2-Methylphenol	95-48-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	108-10-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75-07-0	6.26E-07	1.98E-07	5.07E-08	1.98E-07	5.07E-08
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	2.09E-06	6.59E-07	1.69E-07	6.59E-07	1.69E-07
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	4.91E-08	1.55E-08	3.98E-09	1.55E-08	3.98E-09
Biphenyl	92-52-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	117-81-7	3.52E-08	1.11E-08	2.85E-09	1.11E-08	2.85E-09
Bromoform	75-25-2	2.50E-07	7.91E-08	2.03E-08	7.91E-08	2.03E-08
Cadmium (Cd) Compounds		8.41E-09	2.66E-09	6.82E-10	2.66E-11	6.82E-12
Carbon Disulfide	75-15-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		2.86E-08	9.05E-09	2.32E-09	9.05E-11	2.32E-11
Cumene	98-82-8	2.63E-09	8.30E-10	2.13E-10	8.30E-10	2.13E-10
Di-n-butylphthalate	84-74-2	7.20E-08	2.28E-08	5.84E-09	2.28E-08	5.84E-09
Dibenzofuran	132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110-54-3	7.42E-06	2.34E-06	6.01E-07	2.34E-06	6.01E-07
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	8.05E-08	2.55E-08	6.53E-09	2.55E-08	6.53E-09
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		5.72E-09	1.81E-09	4.63E-10	1.81E-11	4.63E-12
m-Xylene + p-Xylene		2.36E-07	7.46E-08	1.91E-08	7.46E-08	1.91E-08
Methylene Chloride	75-09-2	9.91E-07	3.13E-07	8.03E-08	3.13E-07	8.03E-08
Naphthalene	91-20-3	2.25E-08	7.11E-09	1.82E-09	7.11E-09	1.82E-09
Nickel (Ni) Compounds		4.43E-08	1.40E-08	3.59E-09	1.40E-10	3.59E-11
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	8.64E-08	2.73E-08	7.00E-09	2.73E-08	7.00E-09
Phenol	108-95-2	6.49E-08	2.05E-08	5.26E-09	2.05E-08	5.26E-09
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108-88-3	1.49E-06	4.69E-07	1.20E-07	4.69E-07	1.20E-07
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			6.01E-06	1.54E-06	5.98E-06	1.53E-06

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #1. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2012 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2012 Mixing Emissions - Belt Coat [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	Controlled HAP Emissions[3] (tons/yr)	Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	2.87E-07	2.90E-07	7.44E-08	2.90E-07	7.44E-08
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	2.57E-09	2.61E-09	6.68E-10	2.61E-09	6.68E-10
2-Butanone	78-93-3	8.11E-07	8.21E-07	2.11E-07	8.21E-07	2.11E-07
2-Methylphenol	95-48-7	7.77E-08	7.87E-08	2.02E-08	7.87E-08	2.02E-08
4-Methyl-2-Pentanone	108-10-1	1.13E-05	1.14E-05	2.93E-06	1.14E-05	2.93E-06
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	4.62E-08	4.68E-08	1.20E-08	4.68E-08	1.20E-08
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	1.02E-07	1.03E-07	2.65E-08	1.03E-07	2.65E-08
Biphenyl	92-52-4	5.07E-08	5.13E-08	1.32E-08	5.13E-10	1.32E-10
bis(2-Ethylhexyl)phthalate	117-81-7	1.07E-07	1.08E-07	2.78E-08	1.08E-07	2.78E-08
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		6.31E-09	6.39E-09	1.64E-09	6.39E-11	1.64E-11
Carbon Disulfide	75-15-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon Tetrachloride	56-23-5	1.07E-07	1.08E-07	2.78E-08	1.08E-07	2.78E-08
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		5.32E-08	5.39E-08	1.38E-08	5.39E-10	1.38E-10
Cumene	98-82-8	3.60E-09	3.65E-09	9.35E-10	3.65E-09	9.35E-10
Di-n-butylphthalate	84-74-2	4.94E-08	5.00E-08	1.28E-08	5.00E-08	1.28E-08
Dibenzofuran	132-64-9	3.08E-08	3.11E-08	7.98E-09	3.11E-10	7.98E-11
Dimethylphthalate	131-11-3	1.42E-08	1.43E-08	3.67E-09	1.43E-08	3.67E-09
Ethylbenzene	100-41-4	1.92E-07	1.94E-07	4.98E-08	1.94E-07	4.98E-08
Hexane	110-54-3	1.43E-06	1.44E-06	3.70E-07	1.44E-06	3.70E-07
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	2.58E-07	2.61E-07	6.70E-08	2.61E-07	6.70E-08
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		1.12E-08	1.14E-08	2.91E-09	1.14E-10	2.91E-11
m-Xylene + p-Xylene		6.40E-07	6.48E-07	1.66E-07	6.48E-07	1.66E-07
Methylene Chloride	75-09-2	3.48E-05	3.52E-05	9.02E-06	3.52E-05	9.02E-06
Naphthalene	91-20-3	2.77E-07	2.81E-07	7.20E-08	2.81E-07	7.20E-08
Nickel (Ni) Compounds		8.57E-08	8.68E-08	2.23E-08	8.68E-10	2.23E-10
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	2.88E-07	2.91E-07	7.47E-08	2.91E-07	7.47E-08
Phenol	108-95-2	2.49E-07	2.52E-07	6.47E-08	2.52E-07	6.47E-08
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	8.69E-08	8.80E-08	2.26E-08	8.80E-08	2.26E-08
Toluene	108-88-3	1.90E-06	1.93E-06	4.94E-07	1.93E-06	4.94E-07
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			5.39E-05	1.38E-05	5.36E-05	1.38E-05

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #3. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2012 Baseline HAP Mixing Emissions - Mixer #1

PUBLIC VERSION

Mixer 1 - 2012 Mixing Emissions - Base/Sidewall[1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	Controlled HAP Emissions[3] (tons/yr)	Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	3.80E-08	3.60E-08	9.22E-09	3.60E-08	9.22E-09
1,1-Dichloroethene	75-35-4	4.92E-07	4.66E-07	1.19E-07	4.66E-07	1.19E-07
1,3-Butadiene	106-99-0	1.95E-07	1.85E-07	4.73E-08	1.85E-07	4.73E-08
1,4-Dichlorobenzene	106-46-7	6.57E-10	6.21E-10	1.59E-10	6.21E-10	1.59E-10
2-Butanone	78-93-3	2.46E-06	2.33E-06	5.97E-07	2.33E-06	5.97E-07
2-Methylphenol	95-48-7	7.50E-10	7.10E-10	1.82E-10	7.10E-10	1.82E-10
4-Methyl-2-Pentanone	108-10-1	1.34E-05	1.27E-05	3.26E-06	1.27E-05	3.26E-06
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	3.38E-09	3.19E-09	8.19E-10	3.19E-09	8.19E-10
Aniline	62-53-3	3.87E-07	3.66E-07	9.38E-08	3.66E-07	9.38E-08
Benzene	71-43-2	1.03E-07	9.74E-08	2.50E-08	9.74E-08	2.50E-08
Biphenyl	92-52-4	4.88E-09	4.61E-09	1.18E-09	4.61E-11	1.18E-11
bis(2-Ethylhexyl)phthalate	117-81-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		2.30E-09	2.17E-09	5.57E-10	2.17E-11	5.57E-12
Carbon Disulfide	75-15-0	1.79E-07	1.69E-07	4.34E-08	1.69E-07	4.34E-08
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	2.69E-08	2.54E-08	6.51E-09	2.54E-08	6.51E-09
Chromium (Cr) Compounds		2.14E-08	2.02E-08	5.18E-09	2.02E-10	5.18E-11
Cumene	98-82-8	1.50E-09	1.42E-09	3.64E-10	1.42E-09	3.64E-10
Di-n-butylphthalate	84-74-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenzofuran	132-64-9	1.27E-09	1.20E-09	3.07E-10	1.20E-11	3.07E-12
Dimethylphthalate	131-11-3	1.41E-09	1.33E-09	3.41E-10	1.33E-09	3.41E-10
Ethylbenzene	100-41-4	1.05E-07	9.93E-08	2.55E-08	9.93E-08	2.55E-08
Hexane	110-54-3	1.41E-06	1.33E-06	3.41E-07	1.33E-06	3.41E-07
Hydroquinone	123-31-9	7.29E-07	6.89E-07	1.77E-07	6.89E-09	1.77E-09
Isooctane	540-84-1	8.64E-08	8.17E-08	2.09E-08	8.17E-08	2.09E-08
Isophorone	78-59-1	5.34E-08	5.05E-08	1.29E-08	5.05E-08	1.29E-08
Lead (Pb) Compounds		3.08E-09	2.91E-09	7.46E-10	2.91E-11	7.46E-12
m-Xylene + p-Xylene		4.63E-07	4.38E-07	1.12E-07	4.38E-07	1.12E-07
Methylene Chloride	75-09-2	1.68E-06	1.59E-06	4.07E-07	1.59E-06	4.07E-07
Naphthalene	91-20-3	1.56E-08	1.47E-08	3.78E-09	1.47E-08	3.78E-09
Nickel (Ni) Compounds		3.68E-08	3.48E-08	8.93E-09	3.48E-10	8.93E-11
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	3.40E-07	3.21E-07	8.24E-08	3.21E-07	8.24E-08
Phenol	108-95-2	1.32E-08	1.25E-08	3.21E-09	1.25E-08	3.21E-09
Styrene	100-42-5	4.00E-08	3.78E-08	9.70E-09	3.78E-08	9.70E-09
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	5.93E-08	5.61E-08	1.44E-08	5.61E-08	1.44E-08
Toluene	108-88-3	5.39E-07	5.10E-07	1.31E-07	5.10E-07	1.31E-07
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			2.17E-05	5.56E-06	2.09E-05	5.36E-06

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #4. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2012 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2012 Mixing Emissions - Apex/Beads [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	2012 Controlled HAP Emissions[3] (tons/yr)	2012 Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	1.65E-07	1.27E-07	3.25E-08	1.27E-07	3.25E-08
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	1.37E-09	1.05E-09	2.70E-10	1.05E-09	2.70E-10
2-Butanone	78-93-3	1.38E-06	1.06E-06	2.71E-07	1.06E-06	2.71E-07
2-Methylphenol	95-48-7	1.17E-08	8.94E-09	2.29E-09	8.94E-09	2.29E-09
4-Methyl-2-Pentanone	108-10-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		5.51E-07	4.22E-07	1.08E-07	4.22E-07	1.08E-07
Acetophenone	98-86-2	1.67E-08	1.28E-08	3.28E-09	1.28E-08	3.28E-09
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	2.68E-07	2.06E-07	5.28E-08	2.06E-07	5.28E-08
Biphenyl	92-52-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	117-81-7	2.06E-08	1.58E-08	4.04E-09	1.58E-08	4.04E-09
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		4.55E-09	3.49E-09	8.94E-10	3.49E-11	8.94E-12
Carbon Disulfide	75-15-0	1.65E-07	1.27E-07	3.25E-08	1.27E-07	3.25E-08
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	4.81E-07	3.69E-07	9.46E-08	3.69E-07	9.46E-08
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		2.45E-08	1.88E-08	4.81E-09	1.88E-10	4.81E-11
Cumene	98-82-8	1.27E-09	9.70E-10	2.49E-10	9.70E-10	2.49E-10
Di-n-butylphthalate	84-74-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenzofuran	132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	1.06E-07	8.16E-08	2.09E-08	8.16E-08	2.09E-08
Hexane	110-54-3	5.32E-06	4.08E-06	1.05E-06	4.08E-06	1.05E-06
Hydroquinone	123-31-9	2.36E-05	1.81E-05	4.64E-06	1.81E-07	4.64E-08
Isooctane	540-84-1	9.27E-08	7.11E-08	1.82E-08	7.11E-08	1.82E-08
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		1.82E-08	1.40E-08	3.59E-09	1.40E-10	3.59E-11
m-Xylene + p-Xylene		3.70E-07	2.84E-07	7.27E-08	2.84E-07	7.27E-08
Methylene Chloride	75-09-2	3.76E-07	2.89E-07	7.40E-08	2.89E-07	7.40E-08
Naphthalene	91-20-3	2.27E-07	1.74E-07	4.45E-08	1.74E-07	4.45E-08
Nickel (Ni) Compounds		2.23E-08	1.71E-08	4.37E-09	1.71E-10	4.37E-11
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	1.37E-07	1.05E-07	2.69E-08	1.05E-07	2.69E-08
Phenol	108-95-2	6.85E-07	5.25E-07	1.35E-07	5.25E-07	1.35E-07
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108-88-3	1.56E-06	1.19E-06	3.06E-07	1.19E-06	3.06E-07
Vinyl Acetate	108-05-4	2.11E-06	1.62E-06	4.15E-07	1.62E-06	4.15E-07
Total			2.89E-05	7.42E-06	1.09E-05	2.81E-06

[1] As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.
[2] AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #5. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.
[3] PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2012 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2012 Mixing Emissions - Tread

HAPs	CAS#	Emission Factor[1] (lb/lb of rubber)	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	2012 Controlled HAP Emissions[2] (tons/yr)	2012 Controlled HAP Emissions[2] (lb/hr)
1,1,1-Trichloroethane	71-55-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	1.10E-09	2.67E-09	6.84E-10	2.67E-09	6.84E-10
2-Butanone	78-93-3	3.96E-07	9.65E-07	2.47E-07	9.65E-07	2.47E-07
2-Methylphenol	95-48-7	5.40E-09	1.32E-08	3.37E-09	1.32E-08	3.37E-09
4-Methyl-2-Pentanone	108-10-1	2.76E-05	6.71E-05	1.72E-05	6.71E-05	1.72E-05
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	6.90E-08	1.68E-07	4.31E-08	1.68E-07	4.31E-08
Aniline	62-53-3	8.97E-08	2.18E-07	5.60E-08	2.18E-07	5.60E-08
Benzene	71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biphenyl	92-52-4	1.06E-08	2.57E-08	6.60E-09	2.57E-10	6.60E-11
bis(2-Ethylhexyl)phthalate	117-81-7	1.61E-07	3.92E-07	1.00E-07	3.92E-07	1.00E-07
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		1.96E-09	4.77E-09	1.22E-09	4.77E-11	1.22E-11
Carbon Disulfide	75-15-0	3.45E-06	8.39E-06	2.15E-06	8.39E-06	2.15E-06
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	1.43E-06	3.49E-06	8.95E-07	3.49E-06	8.95E-07
Chloromethane	74-87-3	2.93E-07	7.13E-07	1.83E-07	7.13E-07	1.83E-07
Chromium (Cr) Compounds		3.83E-09	9.33E-09	2.39E-09	9.33E-11	2.39E-11
Cumene	98-82-8	1.09E-08	2.65E-08	6.79E-09	2.65E-08	6.79E-09
Di-n-butylphthalate	84-74-2	1.35E-08	3.28E-08	8.41E-09	3.28E-08	8.41E-09
Dibenzofuran	132-64-9	2.98E-09	7.24E-09	1.86E-09	7.24E-11	1.86E-11
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	2.19E-07	5.33E-07	1.37E-07	5.33E-07	1.37E-07
Hexane	110-54-3	1.34E-06	3.26E-06	8.35E-07	3.26E-06	8.35E-07
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	1.43E-07	3.49E-07	8.94E-08	3.49E-07	8.94E-08
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m-Xylene + p-Xylene		5.61E-07	1.37E-06	3.50E-07	1.37E-06	3.50E-07
Methylene Chloride	75-09-2	2.24E-06	5.45E-06	1.40E-06	5.45E-06	1.40E-06
Naphthalene	91-20-3	4.60E-08	1.12E-07	2.87E-08	1.12E-07	2.87E-08
Nickel (Ni) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Toluidine	95-53-4	2.01E-07	4.89E-07	1.25E-07	4.89E-07	1.25E-07
o-Xylene	95-47-6	8.56E-07	2.08E-06	5.34E-07	2.08E-06	5.34E-07
Phenol	108-95-2	3.99E-08	9.70E-08	2.49E-08	9.70E-08	2.49E-08
Styrene	100-42-5	3.83E-06	9.31E-06	2.39E-06	9.31E-06	2.39E-06
t-Butyl Methyl Ether	1634-04-4	2.93E-07	7.13E-07	1.83E-07	7.13E-07	1.83E-07
Tetrachloroethene	127-18-4	9.13E-08	2.22E-07	5.70E-08	2.22E-07	5.70E-08
Toluene	108-88-3	4.91E-07	1.19E-06	3.06E-07	1.19E-06	3.06E-07
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			1.07E-04	2.74E-05	1.07E-04	2.74E-05

[1] AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #6. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.
[2] PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2012 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2012 Mixing Emissions - Total

HAPs	CAS#	2012 Uncontrolled HAP Emissions (tons/yr)	2012 Uncontrolled HAP Emissions (lb/hr)	2012 Controlled HAP Emissions (tons/yr)	2012 Controlled HAP Emissions (lb/hr)
1,1,1-Trichloroethane	71-55-6	4.53E-07	1.16E-07	4.53E-07	1.16E-07
1,1-Dichloroethene	75-35-4	4.66E-07	1.19E-07	4.66E-07	1.19E-07
1,3-Butadiene	106-99-0	2.12E-07	5.44E-08	2.12E-07	5.44E-08
1,4-Dichlorobenzene	106-46-7	6.95E-09	1.78E-09	6.95E-09	1.78E-09
2-Butanone	78-93-3	6.85E-06	1.76E-06	6.85E-06	1.76E-06
2-Methylphenol	95-48-7	1.01E-07	2.60E-08	1.01E-07	2.60E-08
4-Methyl-2-Pentanone	108-10-1	9.12E-05	2.34E-05	9.12E-05	2.34E-05
Acetaldehyde	75-07-0	1.98E-07	5.07E-08	1.98E-07	5.07E-08
Acetaldehyde + Isobutane		4.22E-07	1.08E-07	4.22E-07	1.08E-07
Acetophenone	98-86-2	8.90E-07	2.28E-07	8.90E-07	2.28E-07
Aniline	62-53-3	5.84E-07	1.50E-07	5.84E-07	1.50E-07
Benzene	71-43-2	4.22E-07	1.08E-07	4.22E-07	1.08E-07
Biphenyl	92-52-4	8.17E-08	2.09E-08	8.17E-10	2.09E-10
bis(2-Ethylhexyl)phthalate	117-81-7	5.27E-07	1.35E-07	5.27E-07	1.35E-07
Bromoform	75-25-2	7.91E-08	2.03E-08	7.91E-08	2.03E-08
Cadmium (Cd) Compounds		1.95E-08	5.00E-09	1.95E-10	5.00E-11
Carbon Disulfide	75-15-0	8.69E-06	2.23E-06	8.69E-06	2.23E-06
Carbon Tetrachloride	56-23-5	1.08E-07	2.78E-08	1.08E-07	2.78E-08
Carbonyl Sulfide	463-58-1	3.86E-06	9.89E-07	3.86E-06	9.89E-07
Chloromethane	74-87-3	7.38E-07	1.89E-07	7.38E-07	1.89E-07
Chromium (Cr) Compounds		1.11E-07	2.85E-08	1.11E-09	2.85E-10
Cumene	98-82-8	3.34E-08	8.55E-09	3.34E-08	8.55E-09
Di-n-butylphthalate	84-74-2	1.06E-07	2.71E-08	1.06E-07	2.71E-08
Dibenzofuran	132-64-9	3.96E-08	1.01E-08	3.96E-10	1.01E-10
Dimethylphthalate	131-11-3	1.57E-08	4.02E-09	1.57E-08	4.02E-09
Ethylbenzene	100-41-4	9.08E-07	2.33E-07	9.08E-07	2.33E-07
Hexane	110-54-3	1.25E-05	3.19E-06	1.25E-05	3.19E-06
Hydroquinone	123-31-9	1.88E-05	4.82E-06	1.88E-07	4.82E-08
Isooctane	540-84-1	7.88E-07	2.02E-07	7.88E-07	2.02E-07
Isophorone	78-59-1	5.05E-08	1.29E-08	5.05E-08	1.29E-08
Lead (Pb) Compounds		3.01E-08	7.71E-09	3.01E-10	7.71E-11
m-Xylene + p-Xylene		2.81E-06	7.21E-07	2.81E-06	7.21E-07
Methylene Chloride	75-09-2	4.28E-05	1.10E-05	4.28E-05	1.10E-05
Naphthalene	91-20-3	5.88E-07	1.51E-07	5.88E-07	1.51E-07
Nickel (Ni) Compounds		1.53E-07	3.91E-08	1.53E-09	3.91E-10
o-Toluidine	95-53-4	4.89E-07	1.25E-07	4.89E-07	1.25E-07
o-Xylene	95-47-6	2.83E-06	7.25E-07	2.83E-06	7.25E-07
Phenol	108-95-2	9.07E-07	2.33E-07	9.07E-07	2.33E-07
Styrene	100-42-5	9.35E-06	2.40E-06	9.35E-06	2.40E-06
t-Butyl Methyl Ether	1634-04-4	7.13E-07	1.83E-07	7.13E-07	1.83E-07
Tetrachloroethene	127-18-4	3.66E-07	9.39E-08	3.66E-07	9.39E-08
Toluene	108-88-3	5.29E-06	1.36E-06	5.29E-06	1.36E-06
Vinyl Acetate	108-05-4	1.62E-06	4.15E-07	1.62E-06	4.15E-07
Total		2.17E-04	5.57E-05	1.98E-04	5.08E-05

Goodyear Topeka
2013 Baseline HAP Mixing Emissions - Mixer #1

PUBLIC VERSION

Mixer 1 - 2013 Mixing Emissions - Inner Liner[1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	2013 Controlled HAP Emissions[3] (tons/yr)	2013 Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	8.80E-08	2.99E-06	7.66E-07	2.99E-06	7.66E-07
1,4-Dichlorobenzene	106-46-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	78-93-3	5.32E-06	1.81E-04	4.63E-05	1.81E-04	4.63E-05
2-Methylphenol	95-48-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	108-10-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75-07-0	6.26E-07	2.13E-05	5.45E-06	2.13E-05	5.45E-06
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	2.09E-06	7.08E-05	1.82E-05	7.08E-05	1.82E-05
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	4.91E-08	1.67E-06	4.28E-07	1.67E-06	4.28E-07
Biphenyl	92-52-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	117-81-7	3.52E-08	1.19E-06	3.06E-07	1.19E-06	3.06E-07
Bromoform	75-25-2	2.50E-07	8.50E-06	2.18E-06	8.50E-06	2.18E-06
Cadmium (Cd) Compounds		8.41E-09	2.86E-07	7.33E-08	2.86E-09	7.33E-10
Carbon Disulfide	75-15-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		2.86E-08	9.73E-07	2.49E-07	9.73E-09	2.49E-09
Cumene	98-82-8	2.63E-09	8.91E-08	2.29E-08	8.91E-08	2.29E-08
Di-n-butylphthalate	84-74-2	7.20E-08	2.45E-06	6.27E-07	2.45E-06	6.27E-07
Dibenzofuran	132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	110-54-3	7.42E-06	2.52E-04	6.46E-05	2.52E-04	6.46E-05
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	8.05E-08	2.74E-06	7.01E-07	2.74E-06	7.01E-07
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		5.72E-09	1.94E-07	4.98E-08	1.94E-09	4.98E-10
m-Xylene + p-Xylene		2.36E-07	8.02E-06	2.06E-06	8.02E-06	2.06E-06
Methylene Chloride	75-09-2	9.91E-07	3.37E-05	8.63E-06	3.37E-05	8.63E-06
Naphthalene	91-20-3	2.25E-08	7.63E-07	1.96E-07	7.63E-07	1.96E-07
Nickel (Ni) Compounds		4.43E-08	1.50E-06	3.85E-07	1.50E-08	3.85E-09
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	8.64E-08	2.93E-06	7.52E-07	2.93E-06	7.52E-07
Phenol	108-95-2	6.49E-08	2.20E-06	5.65E-07	2.20E-06	5.65E-07
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108-88-3	1.49E-06	5.04E-05	1.29E-05	5.04E-05	1.29E-05
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			6.45E-04	1.65E-04	6.42E-04	1.65E-04

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #1. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

PUBLIC VERSION

Mixer 1 - 2013 Mixing Emissions - Belt Coat [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	Controlled HAP Emissions[3] (tons/yr)	Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	2.87E-07	3.12E-05	8.00E-06	3.12E-05	8.00E-06
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	2.57E-09	2.80E-07	7.18E-08	2.80E-07	7.18E-08
2-Butanone	78-93-3	8.11E-07	8.82E-05	2.26E-05	8.82E-05	2.26E-05
2-Methylphenol	95-48-7	7.77E-08	8.46E-06	2.17E-06	8.46E-06	2.17E-06
4-Methyl-2-Pentanone	108-10-1	1.13E-05	1.23E-03	3.15E-04	1.23E-03	3.15E-04
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	4.62E-08	5.03E-06	1.29E-06	5.03E-06	1.29E-06
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	1.02E-07	1.11E-05	2.84E-06	1.11E-05	2.84E-06
Biphenyl	92-52-4	5.07E-08	5.52E-06	1.41E-06	5.52E-08	1.41E-08
bis(2-Ethylhexyl)phthalate	117-81-7	1.07E-07	1.16E-05	2.99E-06	1.16E-05	2.99E-06
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		6.31E-09	6.87E-07	1.76E-07	6.87E-09	1.76E-09
Carbon Disulfide	75-15-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon Tetrachloride	56-23-5	1.07E-07	1.17E-05	2.99E-06	1.17E-05	2.99E-06
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		5.32E-08	5.79E-06	1.48E-06	5.79E-08	1.48E-08
Cumene	98-82-8	3.60E-09	3.92E-07	1.01E-07	3.92E-07	1.01E-07
Di-n-butylphthalate	84-74-2	4.94E-08	5.38E-06	1.38E-06	5.38E-06	1.38E-06
Dibenzofuran	132-64-9	3.08E-08	3.35E-06	8.58E-07	3.35E-08	8.58E-09
Dimethylphthalate	131-11-3	1.42E-08	1.54E-06	3.95E-07	1.54E-06	3.95E-07
Ethylbenzene	100-41-4	1.92E-07	2.09E-05	5.35E-06	2.09E-05	5.35E-06
Hexane	110-54-3	1.43E-06	1.55E-04	3.98E-05	1.55E-04	3.98E-05
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	2.58E-07	2.81E-05	7.20E-06	2.81E-05	7.20E-06
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		1.12E-08	1.22E-06	3.13E-07	1.22E-08	3.13E-09
m-Xylene + p-Xylene		6.40E-07	6.96E-05	1.78E-05	6.96E-05	1.78E-05
Methylene Chloride	75-09-2	3.48E-05	3.78E-03	9.70E-04	3.78E-03	9.70E-04
Naphthalene	91-20-3	2.77E-07	3.02E-05	7.74E-06	3.02E-05	7.74E-06
Nickel (Ni) Compounds		8.57E-08	9.33E-06	2.39E-06	9.33E-08	2.39E-08
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	2.88E-07	3.13E-05	8.03E-06	3.13E-05	8.03E-06
Phenol	108-95-2	2.49E-07	2.71E-05	6.96E-06	2.71E-05	6.96E-06
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	8.69E-08	9.45E-06	2.42E-06	9.45E-06	2.42E-06
Toluene	108-88-3	1.90E-06	2.07E-04	5.31E-05	2.07E-04	5.31E-05
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			5.79E-03	1.48E-03	5.76E-03	1.48E-03

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #3. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Mixer 1 - 2013 Mixing Emissions - Base/Sidewall [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	Controlled HAP Emissions[3] (tons/yr)	Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	3.80E-08	3.87E-06	9.91E-07	3.87E-06	9.91E-07
1,1-Dichloroethene	75-35-4	4.92E-07	5.00E-05	1.28E-05	5.00E-05	1.28E-05
1,3-Butadiene	106-99-0	1.95E-07	1.98E-05	5.08E-06	1.98E-05	5.08E-06
1,4-Dichlorobenzene	106-46-7	6.57E-10	6.67E-08	1.71E-08	6.67E-08	1.71E-08
2-Butanone	78-93-3	2.46E-06	2.50E-04	6.41E-05	2.50E-04	6.41E-05
2-Methylphenol	95-48-7	7.50E-10	7.63E-08	1.96E-08	7.63E-08	1.96E-08
4-Methyl-2-Pentanone	108-10-1	1.34E-05	1.36E-03	3.50E-04	1.36E-03	3.50E-04
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	3.38E-09	3.43E-07	8.80E-08	3.43E-07	8.80E-08
Aniline	62-53-3	3.87E-07	3.93E-05	1.01E-05	3.93E-05	1.01E-05
Benzene	71-43-2	1.03E-07	1.05E-05	2.68E-06	1.05E-05	2.68E-06
Biphenyl	92-52-4	4.88E-09	4.96E-07	1.27E-07	4.96E-09	1.27E-09
bis(2-Ethylhexyl)phthalate	117-81-7	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		2.30E-09	2.34E-07	5.99E-08	2.34E-09	5.99E-10
Carbon Disulfide	75-15-0	1.79E-07	1.82E-05	4.66E-06	1.82E-05	4.66E-06
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloromethane	74-87-3	2.69E-08	2.73E-06	7.00E-07	2.73E-06	7.00E-07
Chromium (Cr) Compounds		2.14E-08	2.17E-06	5.57E-07	2.17E-08	5.57E-09
Cumene	98-82-8	1.50E-09	1.53E-07	3.91E-08	1.53E-07	3.91E-08
Di-n-butylphthalate	84-74-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenzofuran	132-64-9	1.27E-09	1.29E-07	3.30E-08	1.29E-09	3.30E-10
Dimethylphthalate	131-11-3	1.41E-09	1.43E-07	3.67E-08	1.43E-07	3.67E-08
Ethylbenzene	100-41-4	1.05E-07	1.07E-05	2.74E-06	1.07E-05	2.74E-06
Hexane	110-54-3	1.41E-06	1.43E-04	3.66E-05	1.43E-04	3.66E-05
Hydroquinone	123-31-9	7.29E-07	7.40E-05	1.90E-05	7.40E-07	1.90E-07
Isooctane	540-84-1	8.64E-08	8.78E-06	2.25E-06	8.78E-06	2.25E-06
Isophorone	78-59-1	5.34E-08	5.42E-06	1.39E-06	5.42E-06	1.39E-06
Lead (Pb) Compounds		3.08E-09	3.13E-07	8.02E-08	3.13E-09	8.02E-10
m-Xylene + p-Xylene		4.63E-07	4.71E-05	1.21E-05	4.71E-05	1.21E-05
Methylene Chloride	75-09-2	1.68E-06	1.71E-04	4.37E-05	1.71E-04	4.37E-05
Naphthalene	91-20-3	1.56E-08	1.58E-06	4.06E-07	1.58E-06	4.06E-07
Nickel (Ni) Compounds		3.68E-08	3.74E-06	9.59E-07	3.74E-08	9.59E-09
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	3.40E-07	3.45E-05	8.85E-06	3.45E-05	8.85E-06
Phenol	108-95-2	1.32E-08	1.34E-06	3.45E-07	1.34E-06	3.45E-07
Styrene	100-42-5	4.00E-08	4.06E-06	1.04E-06	4.06E-06	1.04E-06
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	5.93E-08	6.03E-06	1.55E-06	6.03E-06	1.55E-06
Toluene	108-88-3	5.39E-07	5.48E-05	1.40E-05	5.48E-05	1.40E-05
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			2.33E-03	5.97E-04	2.25E-03	5.76E-04

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #4. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2013 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2013 Mixing Emissions - Apex/Beads [1]

HAPs	CAS#	Emission Factor[2] (lb/lb of rubber)	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	2013 Controlled HAP Emissions[3] (tons/yr)	2013 Controlled HAP Emissions[3] (lb/hr)
1,1,1-Trichloroethane	71-55-6	1.65E-07	1.36E-05	3.49E-06	1.36E-05	3.49E-06
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	1.37E-09	1.13E-07	2.90E-08	1.13E-07	2.90E-08
2-Butanone	78-93-3	1.38E-06	1.13E-04	2.91E-05	1.13E-04	2.91E-05
2-Methylphenol	95-48-7	1.17E-08	9.60E-07	2.46E-07	9.60E-07	2.46E-07
4-Methyl-2-Pentanone	108-10-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		5.51E-07	4.54E-05	1.16E-05	4.54E-05	1.16E-05
Acetophenone	98-86-2	1.67E-08	1.37E-06	3.52E-07	1.37E-06	3.52E-07
Aniline	62-53-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	71-43-2	2.68E-07	2.21E-05	5.67E-06	2.21E-05	5.67E-06
Biphenyl	92-52-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
bis(2-Ethylhexyl)phthalate	117-81-7	2.06E-08	1.69E-06	4.35E-07	1.69E-06	4.35E-07
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		4.55E-09	3.75E-07	9.61E-08	3.75E-09	9.61E-10
Carbon Disulfide	75-15-0	1.65E-07	1.36E-05	3.49E-06	1.36E-05	3.49E-06
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	4.81E-07	3.96E-05	1.02E-05	3.96E-05	1.02E-05
Chloromethane	74-87-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (Cr) Compounds		2.45E-08	2.02E-06	5.17E-07	2.02E-08	5.17E-09
Cumene	98-82-8	1.27E-09	1.04E-07	2.67E-08	1.04E-07	2.67E-08
Di-n-butylphthalate	84-74-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenzofuran	132-64-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	1.06E-07	8.77E-06	2.25E-06	8.77E-06	2.25E-06
Hexane	110-54-3	5.32E-06	4.38E-04	1.12E-04	4.38E-04	1.12E-04
Hydroquinone	123-31-9	2.36E-05	1.95E-03	4.99E-04	1.95E-05	4.99E-06
Isooctane	540-84-1	9.27E-08	7.64E-06	1.96E-06	7.64E-06	1.96E-06
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		1.82E-08	1.50E-06	3.85E-07	1.50E-08	3.85E-09
m-Xylene + p-Xylene		3.70E-07	3.05E-05	7.81E-06	3.05E-05	7.81E-06
Methylene Chloride	75-09-2	3.76E-07	3.10E-05	7.95E-06	3.10E-05	7.95E-06
Naphthalene	91-20-3	2.27E-07	1.87E-05	4.78E-06	1.87E-05	4.78E-06
Nickel (Ni) Compounds		2.23E-08	1.83E-06	4.70E-07	1.83E-08	4.70E-09
o-Toluidine	95-53-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Xylene	95-47-6	1.37E-07	1.13E-05	2.89E-06	1.13E-05	2.89E-06
Phenol	108-95-2	6.85E-07	5.64E-05	1.45E-05	5.64E-05	1.45E-05
Styrene	100-42-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
t-Butyl Methyl Ether	1634-04-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	127-18-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	108-88-3	1.56E-06	1.28E-04	3.29E-05	1.28E-04	3.29E-05
Vinyl Acetate	108-05-4	2.11E-06	1.74E-04	4.46E-05	1.74E-04	4.46E-05
Total			3.11E-03	7.97E-04	1.18E-03	3.02E-04

[1]As a conservative estimate, HAP emissions are based on the assumption that all rubber component types were mixed in Mixer 1, not just tread.

[2]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #5. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[3]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2013 Baseline HAP Mixing Emissions - Mixer #1

Mixer 1 - 2013 Mixing Emissions - Tread

HAPs	CAS#	Emission Factor[1] (lb/lb of rubber)	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	2013 Controlled HAP Emissions[2] (tons/yr)	2013 Controlled HAP Emissions[2] (lb/hr)
1,1,1-Trichloroethane	71-55-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	1.10E-09	2.87E-07	7.35E-08	2.87E-07	7.35E-08
2-Butanone	78-93-3	3.96E-07	1.04E-04	2.66E-05	1.04E-04	2.66E-05
2-Methylphenol	95-48-7	5.40E-09	1.41E-06	3.62E-07	1.41E-06	3.62E-07
4-Methyl-2-Pentanone	108-10-1	2.76E-05	7.21E-03	1.85E-03	7.21E-03	1.85E-03
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	6.90E-08	1.80E-05	4.63E-06	1.80E-05	4.63E-06
Aniline	62-53-3	8.97E-08	2.35E-05	6.02E-06	2.35E-05	6.02E-06
Benzene	71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biphenyl	92-52-4	1.06E-08	2.77E-06	7.09E-07	2.77E-08	7.09E-09
bis(2-Ethylhexyl)phthalate	117-81-7	1.61E-07	4.21E-05	1.08E-05	4.21E-05	1.08E-05
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		1.96E-09	5.13E-07	1.31E-07	5.13E-09	1.31E-09
Carbon Disulfide	75-15-0	3.45E-06	9.01E-04	2.31E-04	9.01E-04	2.31E-04
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	1.43E-06	3.75E-04	9.62E-05	3.75E-04	9.62E-05
Chloromethane	74-87-3	2.93E-07	7.66E-05	1.96E-05	7.66E-05	1.96E-05
Chromium (Cr) Compounds		3.83E-09	1.00E-06	2.57E-07	1.00E-08	2.57E-09
Cumene	98-82-8	1.09E-08	2.85E-06	7.30E-07	2.85E-06	7.30E-07
Di-n-butylphthalate	84-74-2	1.35E-08	3.52E-06	9.03E-07	3.52E-06	9.03E-07
Dibenzofuran	132-64-9	2.98E-09	7.78E-07	2.00E-07	7.78E-09	2.00E-09
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	2.19E-07	5.72E-05	1.47E-05	5.72E-05	1.47E-05
Hexane	110-54-3	1.34E-06	3.50E-04	8.98E-05	3.50E-04	8.98E-05
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	1.43E-07	3.75E-05	9.61E-06	3.75E-05	9.61E-06
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m-Xylene + p-Xylene		5.61E-07	1.47E-04	3.76E-05	1.47E-04	3.76E-05
Methylene Chloride	75-09-2	2.24E-06	5.86E-04	1.50E-04	5.86E-04	1.50E-04
Naphthalene	91-20-3	4.60E-08	1.20E-05	3.08E-06	1.20E-05	3.08E-06
Nickel (Ni) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Toluidine	95-53-4	2.01E-07	5.25E-05	1.35E-05	5.25E-05	1.35E-05
o-Xylene	95-47-6	8.56E-07	2.24E-04	5.74E-05	2.24E-04	5.74E-05
Phenol	108-95-2	3.99E-08	1.04E-05	2.67E-06	1.04E-05	2.67E-06
Styrene	100-42-5	3.83E-06	1.00E-03	2.57E-04	1.00E-03	2.57E-04
t-Butyl Methyl Ether	1634-04-4	2.93E-07	7.66E-05	1.96E-05	7.66E-05	1.96E-05
Tetrachloroethene	127-18-4	9.13E-08	2.39E-05	6.13E-06	2.39E-05	6.13E-06
Toluene	108-88-3	4.91E-07	1.28E-04	3.29E-05	1.28E-04	3.29E-05
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			1.15E-02	2.94E-03	1.15E-02	2.94E-03

[1]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #6. Mixer 1 mixed non-productive rubber so based on the note at the bottom of the RMA emission factor for mixing, the emission factors presented in this table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. Thus, the emission factors presented above for Mixer 1 have been mulitiplied by 90% in order to accurately reflect the portion attributed to non-productive mixing.

[2]PMHAP emitted from Mixer 1 was controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain controlled emissions.

Goodyear Topeka
2013 Baseline HAP Mixing Emissions - Mixer #1

PUBLIC VERSION

Mixer 1 - 2013 Mixing Emissions - Total

HAPs	CAS#	2013 Uncontrolled HAP Emissions (tons/yr)	2013 Uncontrolled HAP Emissions (lb/hr)	2013 Controlled HAP Emissions (tons/yr)	2013 Controlled HAP Emissions (lb/hr)
1,1,1-Trichloroethane	71-55-6	4.87E-05	1.25E-05	4.87E-05	1.25E-05
1,1-Dichloroethene	75-35-4	5.00E-05	1.28E-05	5.00E-05	1.28E-05
1,3-Butadiene	106-99-0	2.28E-05	5.85E-06	2.28E-05	5.85E-06
1,4-Dichlorobenzene	106-46-7	7.46E-07	1.91E-07	7.46E-07	1.91E-07
2-Butanone	78-93-3	7.36E-04	1.89E-04	7.36E-04	1.89E-04
2-Methylphenol	95-48-7	1.09E-05	2.80E-06	1.09E-05	2.80E-06
4-Methyl-2-Pentanone	108-10-1	9.81E-03	2.51E-03	9.81E-03	2.51E-03
Acetaldehyde	75-07-0	2.13E-05	5.45E-06	2.13E-05	5.45E-06
Acetaldehyde + Isobutane		4.54E-05	1.16E-05	4.54E-05	1.16E-05
Acetophenone	98-86-2	9.56E-05	2.45E-05	9.56E-05	2.45E-05
Aniline	62-53-3	6.28E-05	1.61E-05	6.28E-05	1.61E-05
Benzene	71-43-2	4.53E-05	1.16E-05	4.53E-05	1.16E-05
Biphenyl	92-52-4	8.78E-06	2.25E-06	8.78E-08	2.25E-08
bis(2-Ethylhexyl)phthalate	117-81-7	5.66E-05	1.45E-05	5.66E-05	1.45E-05
Bromoform	75-25-2	8.50E-06	2.18E-06	8.50E-06	2.18E-06
Cadmium (Cd) Compounds		2.09E-06	5.37E-07	2.09E-08	5.37E-09
Carbon Disulfide	75-15-0	9.33E-04	2.39E-04	9.33E-04	2.39E-04
Carbon Tetrachloride	56-23-5	1.17E-05	2.99E-06	1.17E-05	2.99E-06
Carbonyl Sulfide	463-58-1	4.15E-04	1.06E-04	4.15E-04	1.06E-04
Chloromethane	74-87-3	7.94E-05	2.03E-05	7.94E-05	2.03E-05
Chromium (Cr) Compounds		1.20E-05	3.06E-06	1.20E-07	3.06E-08
Cumene	98-82-8	3.59E-06	9.19E-07	3.59E-06	9.19E-07
Di-n-butylphthalate	84-74-2	1.13E-05	2.91E-06	1.13E-05	2.91E-06
Dibenzofuran	132-64-9	4.25E-06	1.09E-06	4.25E-08	1.09E-08
Dimethylphthalate	131-11-3	1.68E-06	4.32E-07	1.68E-06	4.32E-07
Ethylbenzene	100-41-4	9.75E-05	2.50E-05	9.75E-05	2.50E-05
Hexane	110-54-3	1.34E-03	3.43E-04	1.34E-03	3.43E-04
Hydroquinone	123-31-9	2.02E-03	5.18E-04	2.02E-05	5.18E-06
Isooctane	540-84-1	8.47E-05	2.17E-05	8.47E-05	2.17E-05
Isophorone	78-59-1	5.42E-06	1.39E-06	5.42E-06	1.39E-06
Lead (Pb) Compounds		3.23E-06	8.28E-07	3.23E-08	8.28E-09
m-Xylene + p-Xylene		3.02E-04	7.74E-05	3.02E-04	7.74E-05
Methylene Chloride	75-09-2	4.60E-03	1.18E-03	4.60E-03	1.18E-03
Naphthalene	91-20-3	6.32E-05	1.62E-05	6.32E-05	1.62E-05
Nickel (Ni) Compounds		1.64E-05	4.21E-06	1.64E-07	4.21E-08
o-Toluidine	95-53-4	5.25E-05	1.35E-05	5.25E-05	1.35E-05
o-Xylene	95-47-6	3.04E-04	7.79E-05	3.04E-04	7.79E-05
Phenol	108-95-2	9.75E-05	2.50E-05	9.75E-05	2.50E-05
Styrene	100-42-5	1.00E-03	2.58E-04	1.00E-03	2.58E-04
t-Butyl Methyl Ether	1634-04-4	7.66E-05	1.96E-05	7.66E-05	1.96E-05
Tetrachloroethene	127-18-4	3.94E-05	1.01E-05	3.94E-05	1.01E-05
Toluene	108-88-3	5.69E-04	1.46E-04	5.69E-04	1.46E-04
Vinyl Acetate	108-05-4	1.74E-04	4.46E-05	1.74E-04	4.46E-05
Total		2.33E-02	5.99E-03	2.13E-02	5.46E-03

Goodyear Topeka

2012 - 2013 Baseline HAP Mixing Emissions - Mixer #1

PUBLIC VERSION

Mixer 1 - 2012 - 2013 Baseline Average Mixing Emissions

Mixed Rubber Types	2012 - 2013 Average Uncontrolled HAP Emissions (tons/yr)	2012 - 2013 Average Uncontrolled HAP Emissions (lb/hr)	2012 - 2013 Average Controlled HAP Emissions (tons/yr)	2012 - 2013 Average Controlled HAP Emissions (lb/hr)
Inner Liner	3.26E-04	8.35E-05	3.24E-04	8.31E-05
Belt Coat	2.92E-03	7.49E-04	2.91E-03	7.46E-04
Base/Sidewall	1.18E-03	3.01E-04	1.13E-03	2.91E-04
Apex/Beads	1.57E-03	4.02E-04	5.94E-04	1.52E-04
Tread	5.79E-03	1.48E-03	5.79E-03	1.48E-03

Mixer 1 - Mixing Emissions - Ethanol Emitting Rubber

HAPs	CAS#	Emission Factor[1] (lb/lb of rubber)	Potential Uncontrolled HAP Emissions (tons/yr)	Potential Uncontrolled HAP Emissions (lb/hr)	Potential Controlled HAP Emissions[2] (tons/yr)	Potential Controlled HAP Emissions[2] (lb/hr)
1,1,1-Trichloroethane	71-55-6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	75-35-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene	106-99-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,4-Dichlorobenzene	106-46-7	1.22E-09	1.10E-04	2.52E-05	1.10E-04	2.52E-05
2-Butanone	78-93-3	4.40E-07	3.99E-02	9.10E-03	3.99E-02	9.10E-03
2-Methylphenol	95-48-7	6.00E-09	5.43E-04	1.24E-04	5.43E-04	1.24E-04
4-Methyl-2-Pentanone	108-10-1	3.06E-05	2.77E+00	6.33E-01	2.77E+00	6.33E-01
Acetaldehyde	75-07-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetaldehyde + Isobutane		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetophenone	98-86-2	7.67E-08	6.94E-03	1.58E-03	6.94E-03	1.58E-03
Aniline	62-53-3	9.97E-08	9.03E-03	2.06E-03	9.03E-03	2.06E-03
Benzene	71-43-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biphenyl	92-52-4	1.17E-08	1.06E-03	2.43E-04	1.06E-05	2.43E-06
bis(2-Ethylhexyl)phthalate	117-81-7	1.79E-07	1.62E-02	3.69E-03	1.62E-02	3.69E-03
Bromoform	75-25-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium (Cd) Compounds		2.18E-09	1.97E-04	4.50E-05	1.97E-06	4.50E-07
Carbon Disulfide	75-15-0	3.83E-06	3.47E-01	7.91E-02	3.47E-01	7.91E-02
Carbon Tetrachloride	56-23-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbonyl Sulfide	463-58-1	1.59E-06	1.44E-01	3.29E-02	1.44E-01	3.29E-02
Chloromethane	74-87-3	3.25E-07	2.95E-02	6.73E-03	2.95E-02	6.73E-03
Chromium (Cr) Compounds		4.26E-09	3.85E-04	8.80E-05	3.85E-06	8.80E-07
Cumene	98-82-8	1.21E-08	1.09E-03	2.50E-04	1.09E-03	2.50E-04
Di-n-butylphthalate	84-74-2	1.50E-08	1.35E-03	3.09E-04	1.35E-03	3.09E-04
Dibenzofuran	132-64-9	3.31E-09	2.99E-04	6.83E-05	2.99E-06	6.83E-07
Dimethylphthalate	131-11-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	100-41-4	2.43E-07	2.20E-02	5.02E-03	2.20E-02	5.02E-03
Hexane	110-54-3	1.49E-06	1.35E-01	3.07E-02	1.35E-01	3.07E-02
Hydroquinone	123-31-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Isooctane	540-84-1	1.59E-07	1.44E-02	3.29E-03	1.44E-02	3.29E-03
Isophorone	78-59-1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead (Pb) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
m-Xylene + p-Xylene		6.24E-07	5.64E-02	1.29E-02	5.64E-02	1.29E-02
Methylene Chloride	75-09-2	2.49E-06	2.25E-01	5.14E-02	2.25E-01	5.14E-02
Naphthalene	91-20-3	5.11E-08	4.62E-03	1.06E-03	4.62E-03	1.06E-03
Nickel (Ni) Compounds		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
o-Toluidine	95-53-4	2.23E-07	2.02E-02	4.61E-03	2.02E-02	4.61E-03
o-Xylene	95-47-6	9.51E-07	8.61E-02	1.97E-02	8.61E-02	1.97E-02
Phenol	108-95-2	4.43E-08	4.01E-03	9.15E-04	4.01E-03	9.15E-04
Styrene	100-42-5	4.25E-06	3.85E-01	8.79E-02	3.85E-01	8.79E-02
t-Butyl Methyl Ether	1634-04-4	3.25E-07	2.95E-02	6.73E-03	2.95E-02	6.73E-03
Tetrachloroethene	127-18-4	1.01E-07	9.19E-03	2.10E-03	9.19E-03	2.10E-03
Toluene	108-88-3	5.45E-07	4.93E-02	1.13E-02	4.93E-02	1.13E-02
Vinyl Acetate	108-05-4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total			4.41E+00	1.01E+00	4.41E+00	1.01E+00

[1]AP-42 Table 4.12-4 DRAFT (6/99) - Cmpd #6. The emission factors presented in the RMA mixing emission factor table are a combination of emissions from productive and non-productive passes, and non-productive mixing is approximately 90% of the total. For permitting purposes it is assumed Mixer 1 will mix both productive and non-productive rubber in the future. Thus, the emission factors presented above represent the combined emission factor for productive and non-productive mixing.
[2]PMHAP emitted from Mixer 1 will be controlled by the mixer dust collector, and thus, the mixer dust collector control efficiency has been applied to obtain potential controlled emissions.

Mixer 1 - 2012 Curing Emissions

HAPs	CAS#	RMA Emission Factor[1] (lb/lb rubber)	Fugitive Emission Factor from Curing Mold Releases[2] (lb/ton rubber)	2012 HAP Emissions (tons/yr)	2012 HAP Emissions (lb/hr)
1,4-Dichlorobenzene	106-46-7	4.98E-09	--	2.72E-08	6.99E-09
Acetophenone	98-86-2	7.50E-08	--	4.11E-07	1.05E-07
Aniline	62-53-3	1.76E-06	--	9.64E-06	2.47E-06
Benzene	71-43-2	1.98E-07	--	1.08E-06	2.78E-07
Biphenyl	92-52-4	9.53E-08	--	5.22E-07	1.34E-07
bis(2-Ethylhexyl)phthalate	117-81-7	1.14E-07	--	6.24E-07	1.60E-07
Carbon Disulfide	75-15-0	2.56E-05	--	1.40E-04	3.60E-05
Carbonyl sulfide	463-58-1	1.09E-06	--	5.96E-06	1.53E-06
Cumene	98-82-8	1.21E-07	--	6.65E-07	1.71E-07
Dibenzofuran	132-64-9	1.16E-08	--	6.36E-08	1.63E-08
Dibutylphthalate	84-74-2	2.07E-07	--	1.13E-06	2.90E-07
Dimethylphthalate	131-11-3	5.64E-09	--	3.09E-08	7.92E-09
Ethyl benzene	100-41-4	5.28E-06	1.06E-04	2.92E-05	7.49E-06
Hexane	110-54-3	4.75E-07	--	2.60E-06	6.67E-07
Methyl bromide	74-83-9	1.14E-07	--	6.22E-07	1.59E-07
Methyl chloride	74-87-3	9.77E-08	--	5.35E-07	1.37E-07
Methyl chloroform	71-55-6	7.92E-08	--	4.34E-07	1.11E-07
Methylene chloride	75-09-2	9.77E-07	--	5.35E-06	1.37E-06
Methyl isobutyl ketone	108-10-1	1.40E-05	--	7.66E-05	1.97E-05
m-Xylene + p-Xylene		1.72E-05	--	9.40E-05	2.41E-05
Naphthalene	91-20-3	6.93E-08	--	3.80E-07	9.73E-08
o-Cresol	95-48-7	1.08E-08	--	5.93E-08	1.52E-08
o-Toluidine	95-53-4	1.82E-07	--	9.99E-07	2.56E-07
o-Xylene	95-47-6	4.23E-06	--	2.31E-05	5.93E-06
Phenol	108-95-2	7.79E-08	--	4.26E-07	1.09E-07
Styrene	100-42-5	3.96E-07	--	2.17E-06	5.56E-07
Tetrachloroethylene	127-18-4	7.66E-08	--	4.19E-07	1.08E-07
Toluene	108-88-3	6.60E-06	--	3.62E-05	9.27E-06
Xylene	1330-20-7	--	4.33E-04	1.19E-06	3.04E-07
Total				4.35E-04	1.11E-04

[1]AP-42, Table 4.12-11 DRAFT (6/99) - Tire A

[2]Based on the amounts of curing mold release agents used and their respective HAP contents as reported in the R.Y. 2013 AEI.

Goodyear Topeka

2013 Baseline HAP Curing Emissions - Mixer #1

PUBLIC VERSION

Mixer 1 - 2013 Curing Emissions

HAPs	CAS#	RMA Emission Factor[1] (lb/lb rubber)	Fugitive Emission Factor from Curing Mold Releases[2] (lb/ton rubber)	2013 HAP Emissions (tons/yr)	2013 HAP Emissions (lb/hr)
1,4-Dichlorobenzene	106-46-7	4.98E-09	--	1.80E-06	4.61E-07
Acetophenone	98-86-2	7.50E-08	--	2.71E-05	6.94E-06
Aniline	62-53-3	1.76E-06	--	6.36E-04	1.63E-04
Benzene	71-43-2	1.98E-07	--	7.15E-05	1.83E-05
Biphenyl	92-52-4	9.53E-08	--	3.44E-05	8.83E-06
bis(2-Ethylhexyl)phthalate	117-81-7	1.14E-07	--	4.11E-05	1.05E-05
Carbon Disulfide	75-15-0	2.56E-05	--	9.25E-03	2.37E-03
Carbonyl sulfide	463-58-1	1.09E-06	--	3.93E-04	1.01E-04
Cumene	98-82-8	1.21E-07	--	4.39E-05	1.12E-05
Dibenzofuran	132-64-9	1.16E-08	--	4.19E-06	1.07E-06
Dibutylphthalate	84-74-2	2.07E-07	--	7.47E-05	1.91E-05
Dimethylphthalate	131-11-3	5.64E-09	--	2.04E-06	5.22E-07
Ethyl benzene	100-41-4	5.28E-06	1.06E-04	1.93E-03	4.94E-04
Hexane	110-54-3	4.75E-07	--	1.72E-04	4.40E-05
Methyl bromide	74-83-9	1.14E-07	--	4.10E-05	1.05E-05
Methyl chloride	74-87-3	9.77E-08	--	3.53E-05	9.05E-06
Methyl chloroform	71-55-6	7.92E-08	--	2.86E-05	7.34E-06
Methylene chloride	75-09-2	9.77E-07	--	3.53E-04	9.05E-05
Methyl isobutyl ketone	108-10-1	1.40E-05	--	5.05E-03	1.30E-03
m-Xylene + p-Xylene		1.72E-05	--	6.20E-03	1.59E-03
Naphthalene	91-20-3	6.93E-08	--	2.50E-05	6.42E-06
o-Cresol	95-48-7	1.08E-08	--	3.91E-06	1.00E-06
o-Toluidine	95-53-4	1.82E-07	--	6.59E-05	1.69E-05
o-Xylene	95-47-6	4.23E-06	--	1.53E-03	3.91E-04
Phenol	108-95-2	7.79E-08	--	2.81E-05	7.21E-06
Styrene	100-42-5	3.96E-07	--	1.43E-04	3.67E-05
Tetrachloroethylene	127-18-4	7.66E-08	--	2.77E-05	7.09E-06
Toluene	108-88-3	6.60E-06	--	2.38E-03	6.11E-04
Xylene	1330-20-7	--	4.33E-04	7.82E-05	2.00E-05
Total				2.87E-02	7.35E-03

[1]AP-42, Table 4.12-11 DRAFT (6/99) - Tire A

[2]Based on the amounts of curing mold release agents used and their respective HAP contents as reported in the R.Y. 2013 AEI.

Goodyear Topeka

PUBLIC VERSION

2012 - 2013 Baseline HAP Curing Emissions - Mixer #1

Mixer 1 - 2012 - 2013 Baseline Average Curing Emissions

	2012 - 2013 Average HAP Emissions (tons/yr)	**2012 - 2013 Average HAP Emissions (lb/hr)**
Total	1.46E-02	3.73E-03

Goodyear Topeka
Potential HAP Curing Emissions - Mixer #1

Mixer 1 - Curing Emissions

HAPs	CAS#	RMA Emission Factor[1] (lb/lb rubber)	Fugitive Emission Factor from Curing Mold Releases[2] (lb/ton rubber)	Potential HAP Emissions (tons/yr)	Potential HAP Emissions (lb/hr)
1,4-Dichlorobenzene	106-46-7	4.98E-09	--	4.50E-04	1.03E-04
Acetophenone	98-86-2	7.50E-08	--	6.79E-03	1.55E-03
Aniline	62-53-3	1.76E-06	--	1.59E-01	3.64E-02
Benzene	71-43-2	1.98E-07	--	1.79E-02	4.09E-03
Biphenyl	92-52-4	9.53E-08	--	8.63E-03	1.97E-03
bis(2-Ethylhexyl)phthalate	117-81-7	1.14E-07	--	1.03E-02	2.35E-03
Carbon Disulfide	75-15-0	2.56E-05	--	2.32E+00	5.29E-01
Carbonyl sulfide	463-58-1	1.09E-06	--	9.85E-02	2.25E-02
Cumene	98-82-8	1.21E-07	--	1.10E-02	2.51E-03
Dibenzofuran	132-64-9	1.16E-08	--	1.05E-03	2.40E-04
Dibutylphthalate	84-74-2	2.07E-07	--	1.87E-02	4.27E-03
Dimethylphthalate	131-11-3	5.64E-09	--	5.11E-04	1.17E-04
Ethyl benzene	100-41-4	5.28E-06	1.06E-04	4.83E-01	1.10E-01
Hexane	110-54-3	4.75E-07	--	4.30E-02	9.83E-03
Methyl bromide	74-83-9	1.14E-07	--	1.03E-02	2.35E-03
Methyl chloride	74-87-3	9.77E-08	--	8.85E-03	2.02E-03
Methyl chloroform	71-55-6	7.92E-08	--	7.17E-03	1.64E-03
Methylene chloride	75-09-2	9.77E-07	--	8.85E-02	2.02E-02
Methyl isobutyl ketone	108-10-1	1.40E-05	--	1.27E+00	2.89E-01
m-Xylene + p-Xylene		1.72E-05	--	1.55E+00	3.55E-01
Naphthalene	91-20-3	6.93E-08	--	6.28E-03	1.43E-03
o-Cresol	95-48-7	1.08E-08	--	9.81E-04	2.24E-04
o-Toluidine	95-53-4	1.82E-07	--	1.65E-02	3.77E-03
o-Xylene	95-47-6	4.23E-06	--	3.83E-01	8.73E-02
Phenol	108-95-2	7.79E-08	--	7.05E-03	1.61E-03
Styrene	100-42-5	3.96E-07	--	3.59E-02	8.19E-03
Tetrachloroethylene	127-18-4	7.66E-08	--	6.93E-03	1.58E-03
Toluene	108-88-3	6.60E-06	--	5.98E-01	1.36E-01
Xylene	1330-20-7	--	4.33E-04	1.96E-02	4.47E-03
Total				7.19E+00	1.64E+00

[1]AP-42, Table 4.12-11 DRAFT (6/99) - Tire A

[2]Based on the amounts of curing mold release agents used and their respective HAP contents as reported in the R.Y. 2013 AEI.

APPENDIX C: RBLC DATABASE

PUBLIC VERSION

RBLC Search Results - Rubber Mixing

Facility Name	State	Permit Date	Last Update	Process Name	Throughput		Regulated Pollutant	Control Method	Case-By-Case Basis	% Eff.	Emission Limit
GOODYEAR LAWTON TIRE PLANT	OK	12/15/2010	7/13/2011	Banbury mixer			Volatile Organic Compounds (VOC)	regenerative thermal oxidizer (RTO)	BACT-PSD	95	Reduce ethanol 95 wt % or to 20 ppmvd corrected to 3% O2, whichever is less stringent.
THE GOODYEAR TIRE & RUBBER COMPANY	AL	12/29/2008	2/24/2009	NONPRODUCTIVE RUBBER MIXING	25000	LB/H	Volatile Organic Compounds (VOC)	REGENERATIVE THERMAL OXIDIZER	BACT-PSD	95	8.1 LB/T OF RUBBER, 235.1 TPY 12 MONTH ROLLING PERIOD
THE GOODYEAR TIRE & RUBBER COMPANY	AL	12/29/2008	2/24/2009	PRODUCTIVE RUBBER MIXING	25000	LB/H	Volatile Organic Compounds (VOC)		BACT-PSD	0	8.1 LB/T OF RUBBER, 235.1 TPY 12 MONTH ROLLING PERIOD
CONTINENTAL TIRE NORTH AMERICA, INC.	IL	6/23/2006	10/10/2006	RUBBER MIXERS AND CURING PRESSES			Volatile Organic Compounds (VOC)		BACT-PSD	0	0.387 LB/LB RUBBER
CONTINENTAL TIRE NORTH AMERICA, INC.	IL	6/23/2006	10/10/2006	MIXERS, SILICA FORMULATION, NON-PRODUCTIVE RUBBER			Volatile Organic Compounds (VOC)		BACT-PSD	0	0.003 LB/LB rubber, 80 ppm
CONTINENTAL TIRE NORTH AMERICA, INC.	IL	6/23/2006	10/10/2006	MIXERS, NON-SILICA NON-PRODUCTIVE RUBBER			Volatile Organic Compounds (VOC)		BACT-PSD	0	2.15e-4 LB/LB rubber, 25 ppm
CONTINENTAL TIRE NORTH AMERICA, INC.	IL	6/23/2006	10/10/2006	MIXERS, PRODUCTIVE RUBBER			Volatile Organic Compounds (VOC)		BACT-PSD	0	2.15e-4 LB/LB rubber
DAYTON TIRE & RUBBER CO	OK	4/19/2004	7/1/2004	RUBBER MIXING			Volatile Organic Compounds (VOC)	NO ADD-ON CONTROLS	BACT-PSD	0	934 TPY
GOODYEAR TIRE & RUBBER CO., LAWTON TIRE PLANT	OK	12/11/2002	10/17/2003	BANBURY MIXER			Volatile Organic Compounds (VOC)	RTO	BACT-PSD	95	30.42 TPY, 20 ppm
THE GOODYEAR TIRE & RUBBER COMPANY	GA	12/3/2002	2/18/2003	PRESSES, BANBURY, & MILLS			Ethyl Alcohol	Combined determination for many emission units: ring tread presses 1 through 24; platen tread press 1 through 4; banbury mixer 1 & 2; dump mill 1 & 2; and Finish mill 1. BACT PSD determination is no controls, combined limit for ethanol only.	BACT-PSD	0	10 TPY 12-month combined
MICHELIN NORTH AMERICA, INC.-SANDY SPRINGS US2	SC	12/3/2002	11/18/2004	MIXING OPERATIONS			Volatile Organic Compounds (VOC)		BACT-PSD	0	101 TPY MIXING OPERATIONS LINES 1-5,7 AND 11; 130 TPY FACILITY WIDE
GOODYEAR TIRE AND RUBBER COMPANY	AL	1/11/2001	2/10/2003	BANBURY MIXING OPERATION	70.3	T/YR	Volatile Organic Compounds (VOC)	LIMITATIONS ON VOC EMISSIONS PER TON OF RUBBER MIXED ON A PER-BATCH BASIS, VOC EMISSIONS PERTON RUBBER MIXED COMPOUNDED ON A MONTHLYAVERAGE, AND LB VOC EMISSIONS/HR.	BACT-PSD	0	5.82 LB/TON, 17.29 LB/HR

APPENDIX D: LAWTON PLANT INFORMATION

TABLE 4.1-A

[redacted]

[redacted]

[redacted]

TABLE 4.1-B

[redacted]

[redacted]

[redacted]

TABLE 4.2

[redacted]

[redacted]

Discussion of Test Results

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

David Woodring/NA/GDYR

03/14/2008 02:38 PM

To Eric Wamsley/NA/GDYR@GOODYEAR, Bryce Smith/NA/GDYR@GOODYEAR, Gregory Cash/NA/GDYR@GOODYEAR, Jack

cc Jeff Sussman/NA/GDYR@GOODYEAR, David Chapman/NA/GDYR@GOODYEAR

bcc

Subject Stack Test Report - Lawton, Ethanol Emissions From Mixing

I have received the final report from CRA for the stack tests conducted at Lawton mixing on November 6-7, 2007. These test runs were similar to the tests previously conducted on mixers at Union City and Fayetteville. The mixer that was tested at Lawton is equipped with a roller die extruder, whereas the Union City and Fayetteville test mixers were all equipped with pelletizers.

Two rubber compounds were mixed during the Lawton tests. Ethanol emissions were measured at both the baghouse exhaust and at the RTO inlet. Although the concentrations at both locations should theoretically be the same, the measured concentration were found to be somewhat different. This is a sampling anomaly that we have not yet been able to explain. In the test report, two sets of emissions results are presented, with a separate set of results presented based on measurements at each of the two probe locations.

For emissions calculations from mixing HDS compounds, Goodyear has assumed that 75% or the theoretical total ethanol emissions are generated during mixing (and 25% assumed to occur during curing). By comparison, the test report shows the following results:

For the first compound tested, and using measurements taken in the baghouse and scrubber ductwork, 76% of the theoretical total ethanol emissions were measured.
For the first compound tested, and using measurements taken at the RTO inlet and in the scrubber ductwork, 99% of the theoretical total ethanol emissions were measured.

For the second compound tested, and using measurements taken in the baghouse and scrubber ductwork, 60% of the theoretical total ethanol emissions were measured.
For the second compound tested, and using measurements taken at the RTO inlet and in the scrubber ductwork, 85% of the theoretical total ethanol emissions were measured.

Although the test results are not as conclusive as I would have liked, the results do suggest that the hood capture efficiency on mixers equipped with roller die extruders is very good and that Goodyear's assumption that 75% of total theoretical ethanol emissions is generated during mixing is, at least on average, a reasonable approximation.

I am sending a hard copy of the test report to each of you through the company mail. You should receive your copy next week.

Thanks,

Dave Woodring

David Woodring/NA/GDYR		To	mkrentz@CRAworld.com@INTERNET
02/27/2008 02:09 PM		cc	tbathory@CRAworld.com@INTERNET
		bcc	
		Subject	Lawton Draft Stack Test Report

Marty/Tim, I have looked at both versions of the draft report. The first used the ethanol concentration and flowrates measured at the baghouse outlet to calculate emission rates. The second used RTO inlet concentrations and baghouse outlet flowrates to calculate emission rates.

I would prefer using the first version of the calculation sheet (both flowrates and concentrations at the baghouse outlet) as the basic report results. However, I would appreciate if you would then include a paragraph explanation that the RTO inlets were somewhat different than the concentrations measured at the baghouse outlet. You could then say that if the RTO inlet concentrations were used with the baghouse outlet flows (accurate flows at the RTO inlet could not be determined) the results would be as shown on the second results sheet.

In this way, both sets of results would be shown in the report.

Please let me know if you have questions.

Thanks,

Dave Woodring